2017

Kentucky Diabetes Report

The Cabinet for Health and Family Services

and the Personnel Cabinet Present:

A report to the Legislative Research Commission in fulfillment of Kentucky Revised Statute 211.752

1/10/2017

2017 Kentucky Diabetes Report

DEPARTMENT FOR MEDICAID SERVICES
DEPARTMENT FOR PUBLIC HEALTH
OFFICE OF HEALTH POLICY
On behalf of the
CABINET FOR HEALTH AND FAMILY SERVICES

DEPARTMENT OF EMPLOYEE INSURANCE
On behalf of the
PERSONNEL CABINET

For More Information

To access or download copies of this report, visit
http://chfs.ky.gov/dph/info/dpqi/cd/diabetes.htm

To request print copies of this report, please call the Kentucky Diabetes Prevention and Control Program at (502) 564-7996.

For more information about the legislation requiring the Diabetes Report, visit
www.lrc.ky.gov/statues/statute.aspx?id=39837

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Message from the Cabinet Secretaries of Health & Family Services and Personnel

We are pleased to share with you the "2017 Kentucky Diabetes Report." This report was jointly developed by the Department for Medicaid Services, the Department for Public Health and the Office of Health Policy within the Cabinet for Health and Family Services; and the Department of Employee Insurance - Kentucky Employees' Health Plan (KEHP) within the Personnel Cabinet. The report includes: data on the scope and cost of diabetes for each collaborative partner, information about how each partner is addressing diabetes prevention and control for their respective populations; benchmarks for tracking progress in addressing diabetes, recommendations on how the state can improve diabetes outcomes, and a budget to implement recommendations if funding becomes available.

Diabetes is a common, serious, and costly disease in the Commonwealth. The good news is that diabetes is controllable, and in the case of type 2 diabetes, can be preventable with known interventions. Achieving this, however, is a complex endeavor requiring the collective efforts of many partners, including healthcare providers, policy-makers, public and private health plans, individuals with diabetes, public health agencies, technology resources, communities, and more. The collaborators on this report and their partners represent a significant contribution toward this goal, offering a wide range of activities designed to improve diabetes prevention and control in their respective populations and Kentucky as a whole.

The enhanced collaboration among the agencies producing this report has led to the generation of new ideas and renewed energy regarding diabetes prevention and control in the Commonwealth. We are pleased to share this report and look forward to your feedback and future collaborative opportunities.

Sincerely,

Vickie Yates Brown Glisson
Secretary, Cabinet for Health and Family Services

Thomas B. Stephens
Secretary, Personnel Cabinet

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Executive Summary

This report, compiled by the Kentucky Department for Public Health (DPH), Department for Medicaid Services (DMS), Office of Health Policy (OHP), and the Personnel Cabinet - Kentucky Employees' Health Plan (KEHP), includes data on the scope and cost of diabetes for each collaborative partner; demonstrates how each partner is addressing diabetes prevention and control for their population; establishes benchmarks for tracking progress in addressing diabetes; and makes recommendations on how the state can improve diabetes outcomes, including how new state funds for diabetes would be used to improve efforts to prevent diabetes and minimizes complications of the disease.

The Scope of Diabetes in Kentucky

Diabetes is Common:

Diabetes is a common disease in Kentucky and the nation, with type 2 diabetes being the most common form:

Prevalence in adults:

- The prevalence of diabetes has increased from 6.5% of Kentucky adults (240,000 adults) in 2000 to 13.4% (458,000 adults) in 2015.
- Among the 225,497 adults covered by the KEHP in 2015, 8% (18,059) had been diagnosed with diabetes based on claims data.
- For State Fiscal Year (SFY) 2015, 10%, or 94,050 adult Medicaid members had a diagnosis of diabetes on at least one claim.

Prevalence in youth

- During SFY 2015, there were 2,942 Medicaid members under the age of 20 who had a diagnosis of diabetes on at least one claim.
- There are 274 youth aged 17 and younger with diabetes covered by KEHP.

Prevalence of diabetes during pregnancy

- Five percent of all pregnant women in Kentucky had gestational diabetes prior to delivery.

Diabetes is Serious:

Common complications of diabetes include:

- Heart and blood vessel disease;
- Kidney damage leading to kidney failure and dialysis;
- Blindness;
- Nerve damage causing pain, then loss of sensation in the feet and hands;
- Foot and leg blood vessel/nerve disease, leading to amputation; and

- Dental disease leading to tooth loss

Diabetes is Costly:

- The American Diabetes Association (ADA) has estimated that the annual cost of diabetes to Kentucky is $2.66 billion dollars in direct medical costs and an additional $1.19 billion in reduced productivity, for a total cost to the Commonwealth of $3.85 billion.
- For Medicaid, diabetes has the third highest overall cost of several common chronic diseases at almost $284 million dollars.
- For KEHP, diabetes is one of the most costly chronic conditions for both active and early retirees at almost $70 million in combined medical and prescription drug costs in 2015.

Diabetes is Controllable and in Some Cases, Preventable

The key to prevention of type 2 diabetes and prevention of diabetes complications is for individuals and health care practitioners to follow evidence-based guidelines concerning diagnosis, treatment, and lifestyle management of diabetes. When guidelines are followed, development of type 2 diabetes can often be slowed or prevented, and the serious complications caused by high blood sugar for those with type 1 or type 2 diabetes can be prevented.

For people with diabetes, learning about diabetes and how it impacts their body is vital for making lifestyle changes and understanding guidance from their physicians. Evidence shows that Diabetes Self-Management Education (DSME) programs offered by people specially trained in how to provide this guidance has the best chance of helping people make needed changes. DSME classes teach how and why a person needs to make changes in physical activity, eating habits, taking medications as directed, tracking their blood sugar, and having routine medical services such as A1C tests, foot exams, eye exams, and an annual flu shot. Actions designed to support the availability and sustainability of accredited DSME programs, physician referral of patients to these programs, and enrollment in the programs is one of the primary recommendations of this report.

Research has shown that the development of type 2 diabetes can be delayed, and in many cases prevented, with moderate weight loss of 5% to 7% of total body weight. People with multiple risk factors for diabetes or a diagnosis of prediabetes can reduce their risk of developing diabetes by 58% through participation in evidence-based lifestyle change programs such as the Diabetes Prevention Program (DPP). In DPP classes, the person at risk for diabetes learns how to make dietary changes and how to increase physical activity to achieve weight loss adequate to normalize blood sugar levels. Efforts that would increase access to, and sustainability of, accredited DPP programs, physician referrals to these programs, and enrollment in programs is another primary recommendation of this report.

Ongoing activities to prevent diabetes and improve diabetes outcomes

DPH, OHP, DMS, KEHP, and their partners support a wide range of activities designed to improve diabetes prevention and control in their respective populations – as well as the state as a whole.

Examples include:

- Providing access to care for prevention, early detection, and treatment of diabetes.
- Collecting, analyzing, and reporting of data to improve understanding of the prevalence, impact, and cost of diabetes in Kentucky.
- Requiring health care providers reimbursed under health plans to collect and report Healthcare Effectiveness Data and Information Set (HEDIS) diabetes measures.
- Providing education about diabetes prevention and control to the public and to health plan members.
- Offering training to health care professionals to provide DSME education programs.
- Encouraging health care providers to refer patients with diabetes to DSME programs.
- Providing Disease Management and Case/Care Management programs for health plan members with serious diabetes complications or multiple chronic conditions.
- Supplying state leadership in the development of a network of sites providing DPP.
- Furnishing leadership in offering Professional Education Programs on diabetes for health care providers.
- Providing Health Risk Assessments to plan members to identify those at risk for diabetes.
- Supporting development of referral mechanisms to connect people with or at risk for diabetes to appropriate care.
- Offering Wellness Programs to plan members to increase physical activity levels and improve dietary choices.
- Convening state partners to coordinate diabetes prevention and control activities and carry out evidence-based activities.

Benchmarks to measure progress

The partners involved in this report have agreed to establish comparable benchmarks to measure progress in diabetes management in the state.

- Medicaid requires the Medicaid Managed Care Organizations to report HEDIS diabetes measures.
- KEHP will report “HEDIS-Like” measures on diabetes.
- DPH will report measures on diabetes clinical benchmarks from the Kentucky Behavioral Risk Factor Surveillance Survey (KyBRFS).

- The Office of Health Policy will report diabetes specific Prevention Quality Indicators (PQIs) as defined and instituted by the Agency for Healthcare Research and Quality (AHRQ).

Collectively, these data will provide a picture of diabetes care, management, and control across the Commonwealth.

Recommendations for Addressing Diabetes

The committee that developed this document has identified a number of recommendations to slow the increase in diabetes prevalence in the Commonwealth, expand the availability of DPP offerings, improve the medical management and self-management of diabetes, and improve our ability to have reliable data to track and understand the scope of this epidemic. These recommendations are consistent with current standards of care and scientific evidence, national and state guidelines/initiatives, existing chronic disease state planning efforts, and federal grant guidance from the Center for Disease Control and Prevention (CDC).

Recommendations include:

1. Strengthen efforts to prevent the development of new cases of diabetes.
2. Increase the use of evidence-based screening guidelines for the diagnosis of prediabetes, diabetes, and gestational diabetes and referral to appropriate service.
3. Strengthen efforts to improve management and control among those who have diabetes.
4. Assure a sustainable diabetes prevention and control public health infrastructure and workforce at the state and local level.
5. Support policy changes to improve outcomes for persons with pre-diabetes and diabetes.
6. Improve diabetes and chronic disease surveillance systems and Health Information Technology (HIT) systems needed to determine the extent and impact of diabetes on the Commonwealth.

In addition to the issues addressed by these recommendations, we acknowledge that to be successful in addressing this epidemic, the Commonwealth must also take actions to impact certain social determinants of health and equity. Social determinants of health are factors that not only negatively impact the ability of certain population groups to access health care, but also seriously limit their ability to live a healthy lifestyle and make lifestyle changes. These include education level, income and the ability to earn a living wage, lack of social support, chronic stress, discrimination, transportation access, access to affordable and nutritious food, and access to safe spaces for physical activity. Successfully impacting these social determinants of health will require effort by a wide variety of community, business, and political leaders across the Commonwealth.

As the burden of diabetes in Kentucky continues to grow, we must increase our efforts to make changes in our communities, health care systems, and personal behaviors in order to impact the growing epidemic. Now is the time for the Commonwealth to act on the information in this report and move forward with making changes to improve diabetes prevention and control for Kentuckians. This will ultimately improve quality of life and promote better health outcomes for Kentuckians.

Preface/Introduction

The *2017 Diabetes Report* is a requirement of KRS 211.752 (Attachment 1). It requires that in odd numbered years, the Department for Public Health, the Department for Medicaid Services, the Office of Health Policy, and the Personnel Cabinet, collaborate in developing a report on the impact of diabetes on the Commonwealth as well as a plan and recommendations to address the epidemic.

This third such report was developed by a committee with representatives from each of the entities named in the legislation. A list of these committee members is included in Attachment 2. In addition, the committee determined that feedback from external stakeholders was needed to enhance the report and ensure that it was a useful document for stakeholders. A feedback session was held on April 22, 2016, and was attended by 32 stakeholders. A summary of the feedback received, which was very positive, is located in Attachment 3. The committee utilized this information in the development of the 2017 report.

This ongoing collaboration has led to new ideas and renewed energy regarding diabetes prevention and control in Kentucky. The following report is offered for your review, use, and feedback. These agencies look forward to future collaborative opportunities.

Section 1: The Scope of Diabetes in Kentucky

This section provides data on the scope of diabetes in the Commonwealth and within the populations covered by the Kentucky Employees' Health Plan and the Medicaid program. When possible, data has been provided specific to youth and for women with either gestational diabetes or with preexisting diabetes at the time of pregnancy. This section also reviews deaths due to diabetes and the financial impact of diabetes and its most common complications. Finally, a comparison of the impact of diabetes to other common chronic conditions is also included. For a basic overview of diabetes, see Attachment 4.

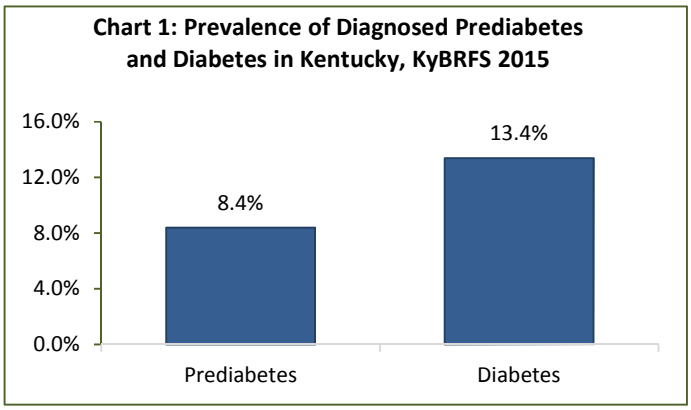
Prevalence and Social Determinants of Diabetes

Statewide Prevalence of Prediabetes and Diabetes in Kentucky: Adults

As in most states, the primary source of data on diabetes prevalence (what percentage of people have a diabetes) is the Kentucky Behavioral Risk Factor Surveillance Survey (KyBRFS). This CDC sponsored survey is managed by the Kentucky Department for Public Health which contracts with the University of Kentucky Survey Research Center to collect the survey data. This survey of adult Kentucky residents ages 18 and older provides the state with important information concerning the health of its residents related to many chronic diseases and risky health behaviors.

KyBRFS data does not distinguish between respondents with type 1 or type 2 diabetes. Based on national trends reported by the CDC, we know that approximately 90% to 95% of adults with diabetes are diagnosed with type 2 diabetes and 5% are diagnosed with type 1 diabetes. It is likely that Kentucky follows this pattern. (Source: CDC National Diabetes Statistics Report, 2014)

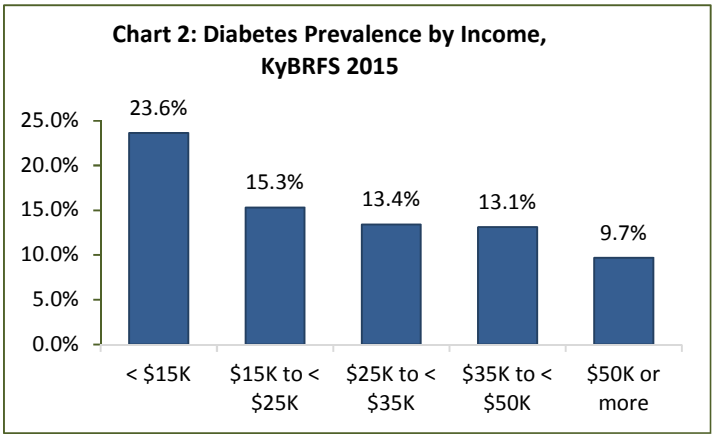
- Data from the KyBRFS shows that 8.4% (approximately 240,000 adults) have been told by a health professional that they have prediabetes and are a high risk of the disorder progressing to a diagnosis of diabetes (Chart 1).



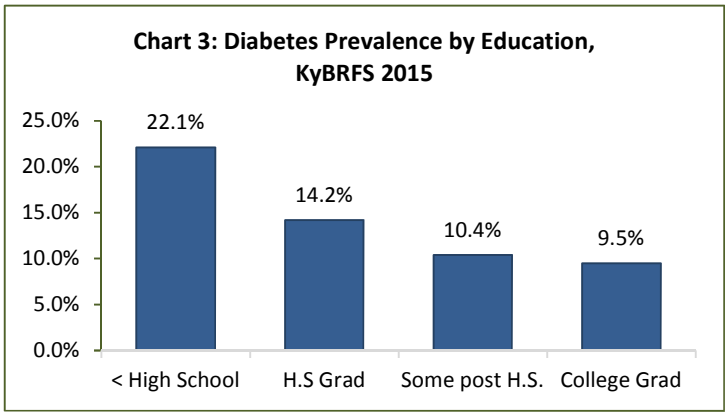
- KyBRFS data indicate that in 2000, approximately 6.5% of Kentucky adults had been diagnosed with diabetes. By 2015, the prevalence rate for diabetes had increased to **13.4% or approximately 458,000 adults** (Chart 1).

Certain life circumstances have been shown to have a strong impact on health, including diabetes prevalence. Among these social determinants of health are income, education and race. Kentucky data shows that diabetes is more common among those with lower incomes and/or lower levels of education.

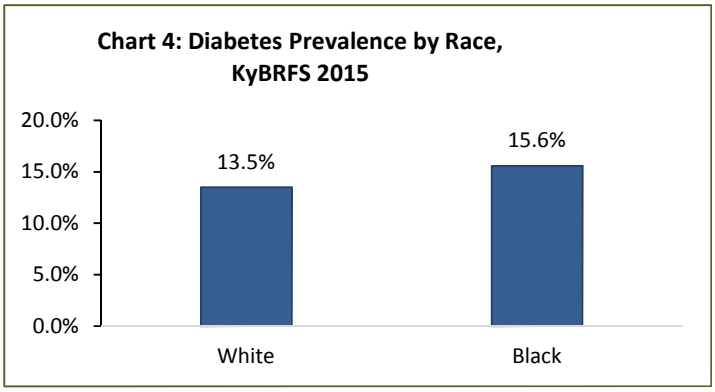
- Chart 2 shows that 23.6% of Kentuckians earning less than $15,000 per year have diabetes compared to 9.7% of those earning at least $50,000 per year.



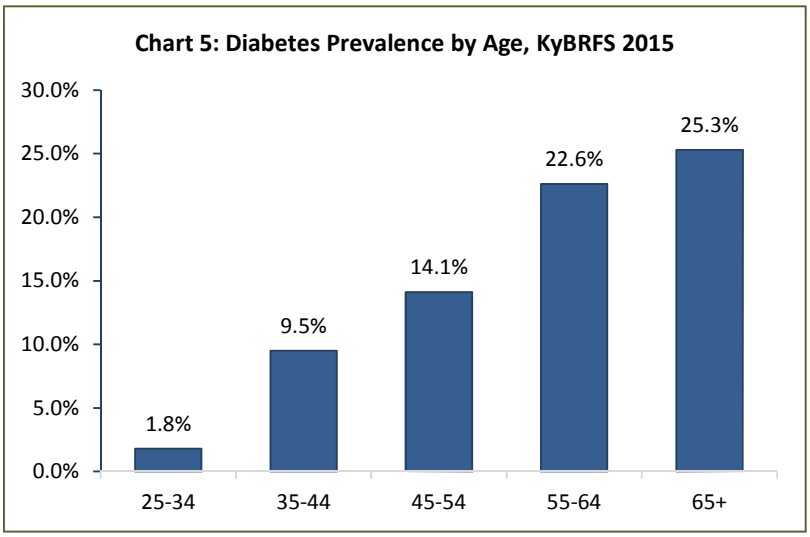
- Chart 3 shows that those with less than a high school education have a diabetes prevalence rate more than twice as high (22.1%) as college graduates (9.5%).



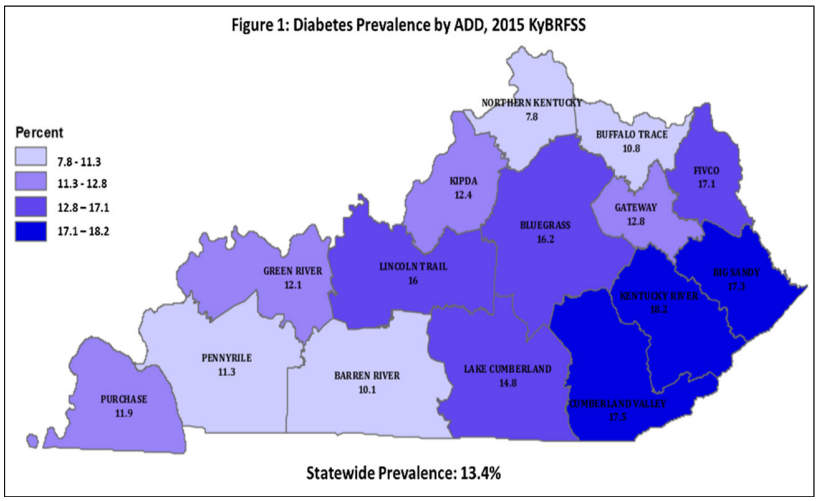
- Chart 4 compares the prevalence of diabetes for whites and blacks in Kentucky. Similar to the rest of the nation, blacks experience higher rates of diabetes.



- Diabetes becomes more prevalent as people age. With an aging population, Kentucky, like the rest of the nation, can expect to continue seeing high rates of diabetes. Approximately 9.5% of those aged 35-44 have diabetes, compared to 14.1% of those aged 45-54, 22.6% of those aged 55-64, and 25.3% of those aged 65 and older (Chart 5).



- Diabetes is more prevalent in Eastern Kentucky (Figure 1) than in other areas of the state. However, it is important to note that in comparison to the national rate of 9.9%, diabetes rates are quite high across all of Kentucky.



- In Kentucky's Appalachian counties, the diabetes rate for adults is 17.5% (163,082) while the rate in non-Appalachian counties is 11.9% (295,299).

Prevalence of Diabetes Among Adult Kentucky Employees' Health Plan Members (KEHP)

In 2015, KEHP covered 225,497 adults. Claims data shows that 8%, or 18,059 of those adult members had a claim with the diagnosis of diabetes. This rate is lower than the rate in the state as a whole. Diabetes rates are somewhat higher among male KEHP members (9.4%) in comparison to female members (7%). (See Chart 6)

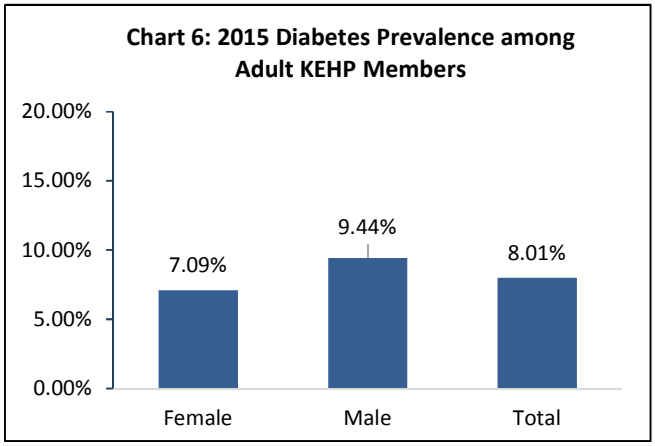


Table 1 shows the percentage and number of adult KEHP members with diabetes living in each Area Development District (ADD). Consistent with rates for the state's overall population, the diabetes prevalence rates among KEHP members are higher in eastern Kentucky ADDs.

Table 1: 2015 Diabetes Prevalence Among Adult KEHP Members by Area Development District (ADD) of Residence

	Prevalence Rate		Number with Diabetes	
Area Development District	**Female**	**Male**	**Female Patients**	**Male Patients**
Barren River	7%	9%	545	473
Big Sandy	11%	13%	495	343
Bluegrass	7%	10%	1,924	1,689
Buffalo Trace	8%	12%	148	141
Cumberland Valley	9%	11%	611	505
FIVCO	10%	13%	347	291
Gateway	9%	12%	239	232
Green River	7%	9%	408	313
KIPDA	8%	10%	1,768	1,483
KY River	9%	11%	364	295
Lake Cumberland	8%	11%	507	468
Lincoln Trail	8%	10%	534	423
Northern KY	7%	10%	652	587
Pennyrile	8%	11%	504	452
Purchase	7%	11%	390	374
Out of State	8%	12%	285	269

Prevalence of Diabetes Among Adult Kentucky Medicaid Members

For SFY 2015, there were 94,050 adult Medicaid members who had a diagnosis of diabetes on at least one medical claim. This is a prevalence rate of 10% which is significantly lower than the state as a whole, and significantly lower than found in previous editions of this report. The Medicaid population would be expected to have a higher prevalence of diabetes than the state at large due to the population having lower incomes and lower levels of education. It is likely that this decrease in prevalence rate is due to two factors, a difference in how the data was analyzed this year and a change in the demographic makeup of the member population due to Medicaid expansion. For this report, individuals with a gap in Medicaid coverage of 45 days or more were excluded from the analysis. Also, Medicaid expansion resulted in an influx of younger adults who would be less likely to have diabetes, thus lowering the overall prevalence in the population.

Table 2: Diabetes Prevalence Rate by Medicaid Region SFY2015
Medicaid Enrolled Adults Aged 20 and older
(excludes individuals with a coverage gap of 45 days or more)

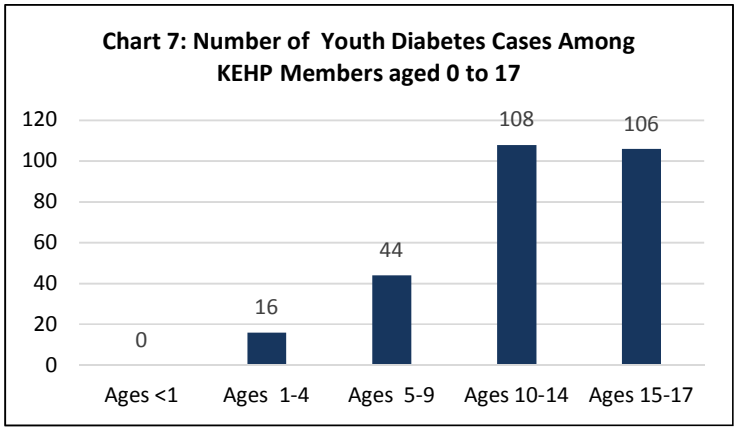
	Prevalence Rate		Number of Diabetes Cases		Total Adult Enrollment	
Medicaid Region (Corresponding ADD)	**Women**	**Men**	**Women with Diabetes**	**Men with Diabetes**	**Total Women Enrolled**	**Total Men Enrolled**
Region 01 (Purchase, partial Pennyrile)	10%	8%	2,673	1,440	26,636	18,199
Region 02 (Green River, partial Pennyrile)	11%	9%	5,071	2,792	44,817	30,521
Region 03 (Lincoln Trail, KIPDA)	9%	8%	11,980	7,026	126,910	89,340
Region 04 (Barren River, Lake Cumberland)	12%	10%	8,226	5,144	68,936	52,045
Region 05 (Bluegrass, Partial Northern KY, partial Cumberland Valley)	10%	8%	9,548	5,514	92,753	66,019
Region 06 (Most of Northern KY)	8%	7%	2,898	1,700	34,626	24,107
Region 07 (Buffalo Trace, FIVCO, Gateway)	13%	10%	4,565	2,759	36,356	27,931
Region 08 (Big Sandy, Ky River, Cumberland Valley)	15%	12%	13,780	8,933	92,022	76,034
Region 09 (Out of State)	4%	0%	1		23	19
Grand Total	**11%**	**9%**	**58,742**	**35,308**	**523,079**	**384,215**
Source: Kentucky DMS						

Prevalence of Diabetes Among Kentucky Youth

There is no reliable source of data on the prevalence of either type 1 or type 2 diabetes among youth in Kentucky. The data from Medicaid and KEHP represent a significant segment of the Kentucky youth population, but omits youth covered by other insurers. Another gap in this data is the inability to separate patients with type 1 and type 2 diabetes diagnoses, which is important in order to determine the extent of diabetes among youth. Efforts to distinguish cases of type 1 from type 2 diabetes using claims data were not successful due to discrepancies in coding. For example, a large number of claims showed that in many instances individuals were coded as having type 1 diabetes on one visit but type 2 diabetes on a different visit; however, this is not clinically possible and, therefore, clearly an error in coding. Research by CDC shows that type 2 diabetes remains fairly rare among youth with a prevalence rate of only 0.24 per 1,000, although prevalence is increasing more rapidly among youth who are African American, Hispanic/Latino American or Native American. Estimates from CDC further show an estimated rate of type 1 diabetes among youth to be 2.22 per 1,000. In addition, CDC sponsored research has shown that among youth aged 12 to 19 years, the overall prevalence rate of prediabetes may be as high as 23%.

KEHP Prevalence of Diabetes: Youth

Among KEHP covered youth, a total of 274 or 0.47% had a diagnosis of diabetes on a claim.



Medicaid Prevalence of Diabetes: Youth

During SFY 2015 there were 2,932 Medicaid members under age 20 who had a diagnosis of diabetes on at least one claim. This is a decrease in the number of Medicaid covered youth with diabetes compared to the previous edition of this report. It is likely that this decrease in prevalence rate is due to a change in how the data was analyzed this year. Individuals with a gap in Medicaid coverage of 45 days or more were excluded from the analysis, resulting in fewer individuals being included in the table.

Table 3: Diabetes Prevalence Rate by Medicaid Region SFY 2015 Medicaid Enrolled Youth Aged 19 and younger (excludes individuals with a coverage gap of 45 days or more)						
	Prevalence Rate		Number of Diabetes Cases		Total Adult Enrollment	
Medicaid Region (Corresponding ADD)	**Girls**	**Boys**	**Girls with Diabetes**	**Boys with Diabetes**	**Total Girls Enrolled**	**Total Boys Enrolled**
Region 01 (Purchase, partial Pennyrile)	<1%	<1%	69	51	14909	15273
Region 02 (Green River, partial Pennyrile)	1%	<1%	138	98	26677	27994
Region 03 (Lincoln Trail, KIPDA)	1%	<1%	441	365	78589	82410
Region 04 (Barren River, Lake Cumberland)	1%	<1%	225	173	38471	39756
Region 05 (Bluegrass, Partial Northern KY, partial Cumberland Valley)	1%	<1%	269	202	53200	55656
Region 06 (Most of Northern KY)	<1%	<1%	81	84	22800	24129
Region 07 (Buffalo Trace, FIVCO, Gateway)	1%	<1%	120	96	18499	19774
Region 08 (Big Sandy, Ky River, Cumberland Valley)	1%	1%	286	244	43916	46695
Region 09 (out of state)	0%	0%			12	9
Grand Total	**1%**	**0%**	**1629**	**1313**	**297073**	**311696**

Prevalence of Diabetes During Pregnancy in Kentucky

Diabetes can cause complications during pregnancy. Gestational diabetes is the more familiar complication of pregnancy, but increasingly, pregnancies occur in women with pre-existing type 1 or type 2 diabetes. Women with gestational diabetes or pre-existing diabetes are at increased risk for preeclampsia or a Cesarean section (C-Section). In addition to these complications, women with pre-existing diabetes are at increased risk for preterm birth, miscarriage, or stillbirth.

Babies born to women with diabetes are at increased risk of high weight at birth which can result in nerve damage to the shoulder/neck during delivery (shoulder dystocia), birth defects of the brain, spine or heart, low blood sugar after birth, and an increased lifetime risk of being obese or overweight as adults and of developing type 2 diabetes.

Table 4 shows all births to Kentucky women for 2014, and indicates whether they were diagnosed with gestational, pre-existing (type 1 or type 2) prior to delivery, or did not have diabetes during the pregnancy. Out of the 56,534 total births, 521 (0.9%) were to mothers with pre-existing diabetes and 2,938 (5.2%) were to mothers with gestational diabetes. This is statistically similar to a national estimate reported by the CDC in 2014 of 5.6% for gestational diabetes.

Table 4: Kentucky 2014 Births – Diabetes in Pregnancy
Source: KY Vital Statistics, Birth Records

Area Development District	Gestational	Pre-Existing	No Diabetes	Unknown	TOTAL	% by ADD
Lake Cumberland	118	28	2,212	70	2,436	6.0%
Barren River	187	31	3422	128	3,768	5.8%
Bluegrass	637	113	9,041	48	9,839	7.6%
Purchase	103	25	2,132	25	2,285	5.6%
Gateway	51	13	980	6	1,050	6.1%
Cumberland Valley	186	38	2,726	86	3,036	7.4%
Northern Kentucky	491	31	4,783	916	6,221	8.4%
FIVCO	139	21	1,518	229	1,907	8.4%
Buffalo Trace	59	9	553	66	687	9.9%
Kentucky River	68	20	1,319	14	1,421	6.2%
Lincoln Trail	186	25	3,294	60	3,565	5.9%
KIPDA	391	107	11,628	305	12,431	4.0%
Pennyrile	113	26	2,454	722	3,315	4.2%
Green River	120	17	2,490	173	2,800	4.9%
Big Sandy	89	17	1,623	52	1,781	6.0%
Total	2,938	521	50,175	2,900	56,534	---
% By Condition	5.2%	0.9%	88.8%	5.1%	100%	6.1%

Hospitalizations During Pregnancy

One important source of data regarding the impact of diabetes on pregnancies in Kentucky is from hospitalizations of pregnant women. Table 5A shows hospitalizations for women with gestational diabetes, pre-existing diabetes, or no diabetes. The hospital stays are categorized as "non-delivery stays" and "delivery stays." A non-delivery stay includes women who are experiencing a complication of pregnancy but who are discharged without delivering at that time. Delivery stays refer to hospitalizations resulting in a delivery. Table 5B looks at only delivery stays focusing on the type of delivery, C-section vs. Vaginal Delivery, for each group.

Table 5A shows that out of 69,376 total maternal stays, 1.3% (873) were for women with pre-existing diabetes and 4.9% (3,433) were for women with gestational diabetes. There are clear differences in the type of maternal stays based on type of diabetes. Almost a third of the hospital stays for women with pre-existing diabetes are non-delivery stays. In comparison, only 6.4% of hospital stays for women with gestational diabetes are non-delivery stays, while the rate is 27.3% for those without a diabetes diagnosis.

Table 5A: Number and Percentage of delivery and non-delivery maternal hospital stays and type of diabetes diagnosis of Mother, Kentucky: 2015

Type of Maternal Stay	Pre-existing Diabetes	Gestational Diabetes	No Diabetes Diagnosis Indicated	Total Maternal Stays
Total Maternal Stays	873	3,433	65,070	69,376
(% of all maternal stays by diabetes type)	1.3%	4.9%	93.8%	100.0%
Non-Delivery Stays	278	221	17,783	18,282
(% of stays which are non- delivery)	31.8%	6.4%	27.3%	26.4%
Stays with Delivery	595	3,212	47,287	51,094
(% of stays with delivery)	68.2%	93.6%	72.7%	73.6%

There are also striking differences in the type of delivery stays based on whether or not the mother has diabetes and the type of diabetes. Table 5B shows that out of 51,094 total delivery stays, 1.2% (595) were for women with pre-existing diabetes and 6.5% (3,212) were for women with gestational diabetes. The highest rate of C-Section (67.2%) is among women with pre-existing diabetes compared to 47.4% of those with gestational diabetes, falling to 34.3% for those without diabetes.

Table 5B: Number and Percentage of Vaginal and C-Section deliveries by type of diabetes diagnosis of Mother, Kentucky: 2015

Type of Delivery	Pre-existing Diabetes	Gestational Diabetes	No Diabetes Diagnosis Indicated	Total Delivery Stays
Number of Delivery Stays	595	3,212	47,287	51,094
(% of all delivery stays by diabetes type)	1.2%	6.3%	92.5%	100.0%
Vaginal	195	1,694	31,073	32,962
(% of deliveries by diabetes type)	32.8%	52.7%	65.7%	64.5%
C-Section	400	1,518	16,214	18,123
(% of deliveries by diabetes type)	67.2%	47.3%	34.3%	35.5%

Source: 2015 Kentucky Hospital Discharge Data, based on all listed diagnoses

KEHP-Pregnancy and Diabetes

Table 6 shows the number of women covered by KEHP who had a diagnosis code of diabetes and a diagnosis code of pregnancy in calendar year 2015. The principal diagnosis indicates the kind of conditions identified with pregnancy and the associated costs.

Table 6: KEHP 2015 Diabetes and Pregnancy		
Principal Diagnosis	**Patients**	**Payment for Medical Care**
Pre-existing Diabetes in Pregnancy	28	$31,432
Diabetes, Antepartum	64	$47,775
Diabetes, Postpartum	3	$152
Diabetes, Delivered	29	$31,891
Diabetic Cataract	17	$9,877
Diabetic Macular Edema	106	$334,464
Diabetic Retinopathy	92	$53,009
Proliferative Diabetic Retinopathy	71	$28,830
Gestational Diabetes	125	$142,943
Diabetes in Pregnancy, Unspecified	20	$5,301
Abnormal GTT complicating Pregnancy	430	$341,430
Family History of Diabetes Mellitus	207	$2,193
Total		$1,029,303

Table 7 shows the class of diabetes medications used by women during pregnancy who had a diagnosis of diabetes and the associated cost.

Table 7: KEHP Pregnancy and Prescription Drugs		
	Patients	**Payment for Prescriptions**
Therapeutic Class Intermed		
Antidiabetic Ag, Sulfonylureas	185	$3,065
Antidiabetic Agents, Insulins	358	$1,877,235
Antidiabetic Agents, Misc	394	$523,840
Diabetes Mell/Diab Supply NEC	481	$202,667

Table 8 shows the number of women who experienced pregnancy during calendar year 2015 and their associated medical costs. Not all women who became pregnant in 2015 also delivered in 2015. Of 2,876 women with diabetes who delivered in calendar year 2015, only 10% had a C-

section. This is significantly lower than the rate of C-section for women without diabetes as reported above in Table 5B.

Table 8: KEHP – Delivery stays and Type of Child Birth for Pregnant Women with a Diagnosis of Diabetes		
	Patients	**Payment for Medical**
Pregnancy w C-Section	274	$400,570.99
Pregnancy w Vaginal Delivery	2,602	$15,850,552.64
Total with Delivery	2,876	$16,251,123.63
Non-Delivery Hospitalizations	5,704	$12,494,762.48
Total Payments		$28,745,886.11

Diabetes Mortality

In 2014, Kentuckians had the 14th highest rate of death due to diabetes in the nation. In that year alone, 1,175 Kentuckians died as a result of diabetes with an age-adjusted rate of 23.4 per 100,000 residents, as compared to the national rate of 21.0 per 100,000 residents. The Kentucky mortality rate for men was 28.1 per 100,000, while the national rate was 25.7 per 100,000. The mortality rate for Kentucky women was 19.9 per 100,000, compared to a national rate of 17.1 (see Table 9).

The racial disparity in mortality rates is particularly striking, both when comparing Kentucky to the nation and when comparing racial groups within Kentucky. The age-adjusted mortality rate for African-American men in Kentucky (39.6) is 1.4 times greater than as for white men in Kentucky (27.7). Likewise, the mortality rate for African-American women in Kentucky is 35.4 compared to 19.0 for white women.

Table 9: 2014 Kentucky Deaths Due to Diabetes (All Ages) By Race and Gender (Source: CDC Wonder and CDC WISQARS)

	Ranked Cause of Death in Kentucky	Kentucky Age-Adjusted Rate	National Age-Adjusted Rate
All Groups	7th	23.4	21.0
Males	6th	28.1	25.7
Females	7th	19.9	17.1
White	7th	22.7	19.3
White Males	6th	27.7	24.1
White Females	7th	19.0	15.3
African-American	5th	37.2	37.3
African-American Males	6th	39.6	42.7
African-American Females	5th	35.4	33.1

There is a significant geographic variation in diabetes mortality across Kentucky. Table 10 shows diabetes mortality rates for each of Kentucky's Area Development Districts. The table lists the number of people for whom diabetes was listed as the underlying cause of death and

the age-adjusted death rate per 100,000 residents. The highest mortality rates occur in Buffalo Trace, Cumberland Valley, and Big Sandy - all in the Appalachia Region.

Table 10: 2014 Kentucky Deaths Due to Diabetes (All Ages) By Area Development District
(Source: CDC Wonder)

ADD	Number of Deaths	Age-Adjusted Rate/100,000
Buffalo Trace	29	42.1
Cumberland Valley	93	35.2
Big Sandy	57	32.8
Kentucky River	37	27
Pennyrile	69	27
Barren River	83	25.4
FIVCO	44	24.6
Northern Kentucky	107	23.5
Lake Cumberland	61	23
Lincoln Trail	67	23
Green River	59	22.2
Bluegrass	179	20.9
KIPDA	224	20
Gateway	18	19.1
Purchase	48	18.2
Total	**1,175**	**23.4**

The Financial Impact of Diabetes and its Complications

Estimated Costs of Diabetes

In a report entitled "Economic Costs of Diabetes in the U.S. in 2012," the American Diabetes Association (ADA) estimated that diabetes costs Kentucky $2.66 billion dollars in direct medical costs and an additional $1.19 billion in reduced productivity, for a total annual cost to the state of $3.85 billion. This analysis further shows that after taking into account the impact of the aging population and gender differences, people with diabetes have costs 2.3 times higher than would be expected in the absence of diabetes.

In addition, the 2012 ADA report estimates the largest component of medical care costs attributed to diabetes (43%) are for inpatient hospital care. Given that inpatient hospital care is such a large component of diabetes expenditures, examining Kentucky's data on diabetes hospitalization costs and patterns is an important component of understanding the impact of this disease on individuals, families and the Commonwealth. This data also serves as a reflection of how well diabetes is, or is not, managed by healthcare providers and patients. The Agency on Healthcare Research and Quality (AHRQ) notes that diabetes hospitalizations "provide insight into the community health care system or services outside the hospital setting. Patients with diabetes may be hospitalized for diabetic complications if their conditions are not adequately monitored or if they do not receive the patient education needed for appropriate self-management." In other words, if a person with diabetes is admitted to the hospital, it can be seen as a reflection of a lack of access to care, a failure to provide appropriate care in the physician's office, an inability of the patient to adhere to their plan of care, or a combination of all three.

Hospitalization Costs Due to Diabetes

Kentucky's inpatient hospital discharge data and emergency department utilization data are collected by the Office of Health Policy (OHP) within the Cabinet for Health and Family Services. This data is routinely referred to as "hospital discharge data" and "ED data," respectively. The data provides a wealth of information on the diagnoses of those hospitalized or treated in an ED and the financial charges associated with each episode of hospitalization or ED visit. Collected pursuant to KRS 216.2920 to 216.2929, the data is standardized administrative information routinely submitted by Kentucky hospitals to bill for their services and is also referred to as "administrative claims data."

Kentucky statutes governing data submission do not allow the state to include individual identification information, which would allow for determination of multiple hospitalizations or emergency department visits by one person. Consequently, this data shows the number of

hospital discharges or emergency department visits that occur during a year, not the actual (unduplicated) number of people who are hospitalized or visit an ED. Individual level data would be very useful in planning how to respond to the manner in which diabetes costs (and indeed all hospitalization and ED costs) are incurred. OHP is exploring alternatives for reporting on an individual level without actually identifying the person in the data set.

Another limitation of this data pertains to the nature of the cost information. Cost information reported is for the initial charges for each hospital discharge or ED visit. The final reimbursement amount is not reported to the state as part of the administrative claims data. The actual amount reimbursed by various payer sources is based on an agreement between the payer and the hospital and is typically far less than the amount charged.

An inpatient hospital discharge record includes all information from admission to discharge. An ED record includes visits to an emergency department that do not result in a 24-hour inpatient admission. ED records do include data of patients that are held for a 23-hour observation stay but not fully admitted as an inpatient to a hospital. This report includes hospital discharge and ED visit data for calendar year 2015.

Table 11 shows the number of hospital discharges in which diabetes was coded as the principal diagnosis. The data is reported by the ADD in which the person resides – not the ADD where the hospital is located. In the calendar 2015, there were 9,192 inpatient hospital discharges from Kentucky hospitals for Kentucky residents for which the primary diagnosis was diabetes (not including gestational diabetes which is reported separately). The total charges associated with these inpatient hospital discharges were $269,148,739.

Table 11: Kentucky Inpatient Discharges for Primary Diabetes Calendar Year 2015

Source: Kentucky Inpatient Hospital Discharge Claims 2015
Primary Diagnosis = Any 250 - 250.99 (ICD9)
Primary Diagnosis = Any E10 - E13.x (ICD10)

Patient ADD	Cases	Total Charges	Average Charges
PURCHASE	401	$9,628,265	$24,011
PENNYRILE	372	$8,327,867	$22,387
GREEN RIVER	330	$7,951,864	$24,097
BARREN RIVER	562	$14,424,384	$25,666
LINCOLN TRAIL	593	$12,363,610	$20,849
KIPDA	2073	$66,608,757	$32,132
NORTHERN KY	807	$22,781,069	$28,229
BUFFALO TRACE	97	$3,602,022	$37,134
GATEWAY	197	$5,872,484	$29,810

FIVCO	343	$9,674,103	$28,204
BIG SANDY	393	$18,291,620	$46,544
KY RIVER	459	$14,538,631	$31,675
CUMBERLAND VALLEY	672	$17,550,138	$26,116
LAKE CUMBERLAND	415	$11,008,001	$26,525
BLUEGRASS	1478	$46,525,926	$31,479
Total	**9192**	**$269,148,739**	**$29,281**

Specific Diabetes Complications as Principal Diagnosis for Inpatient Hospital Discharges

Hospitalizations for diabetes may occur due to a variety of common complications of the disease. Complications discussed in this section of the report are identified by the principal diagnosis code assigned by the physician during the hospital stay. The primary diagnosis is defined in the Uniform Hospital Discharge Data Set (UHDDS) as "that condition established after study to be chiefly responsible for occasioning the admission of the patient to the hospital for care." Table 12 shows discharge data for specific diabetes complications as well as the number of discharges for calendar year 2015, average length of stay (ALOS), average charge for each type of complication, and total charges.

Table 12: Kentucky Inpatient Hospital Discharges 2015 Complications of Primary Diagnosis of Diabetes Hospitalizations

ICD-9-CM Code Title*	Total Discharges	Percent of Discharges	ALOS	Avg. Charge	Total Charges
Without mention of complication	607	6.6%	3.05	$13,832	$8,395,927
Ketoacidosis (DKA)	3,616	39.3%	3.11	$20,047	$72,488,394
Hyperosmolarity	332	3.6%	3.50	$23,438	$7,781,515
With Renal Manifestations	163	1.8%	6.39	$62,664	$10,214,264
With Ophthalmic manifestations	3	0.0%	4.00	$19,878	$59,635
With Neurological Manifestations	947	10.3%	5.07	$31,278	$29,620,312
With Peripheral Circulatory Disorders	616	6.7%	9.06	$61,593	$37,941,251
Other Specified Manifestations	2,846	31.0%	6.60	$35,811	$101,918,239
Unspecified Complications	62	0.7%	3.24	$11,761	$729,202
Total	9,192	100.0%	4.86	$29,281	$269,148,739

*During calendar year 2015 medical coding shifted from ICD-9-CM codes to more detailed ICD-10-CM codes. ICD-10-CM codes were cross-walked to match the ICD-9-CM rubric.
Primary Diagnosis = Any 250 - 250.99 (ICD9) or Any E10 - E13.x (ICD10)
NOTE: Please see Attachment 5 for a detailed table that includes race/ethnicity for these hospitalizations.

- Diabetic ketoacidosis or DKA accounts for more than one third of all diabetes primary hospitalizations. DKA is a life-threatening complication in which ketones (fatty acids) build up in the blood due to a lack of insulin. In 2015, 39.3% (3,616) of all diabetes-primary

cause hospitalizations were a result of DKA, with an ALOS of 3.11 days, an average charge of $20,047, and total billed charges of $72,488,394.

- The second most frequent diabetes complication causing hospitalization was "Other Specified Manifestations," which is a new category under the change from ICD9 to ICD10 codes initiated in 2015. "Other Specified Manifestations include: hypoglycemia, arthropathy, skin condition, and oral complications. This category accounted for 31.0% (2,846) of all cases. The ALOS for this group was 6.6 days with an average charge of $35,811 and total billed charges of $101,918,239.

- Diabetes with peripheral circulatory disorders resulted in the longest ALOS of 9.06 days, an average charge of $61,593 per stay, and total billed charges of $37,941,251 for all stays. Peripheral circulatory disorders contribute significantly to the development of lower extremity infections and can result in amputations.

- Kidney disease leading to kidney failure requiring dialysis and transplant is a common complication of diabetes. Hospitalizations with renal (kidney) complications of diabetes account for a relatively small (1.8%) percentage of cases. However, this group has a significant ALOS at 6.39 days, and also includes the highest average charge of $62,664 per stay with total billed charges of $10,214,264 for all stays.

KEHP Hospitalizations for Diabetes Complications

Table 13 shows the number of hospital admissions and associated costs for KEHP members who had a principal diagnosis code of diabetes. Also shown are the number of admissions, ALOS, the amount paid for all medical and prescription costs while hospitalized for each type of complication, and the amount allowed to be billed based on contractual agreement. The difference between the amount allowed and the net paid is the amount paid out-of-pocket by the patients in the form of deductibles, copayments, and coinsurance.

Similar to the statewide data discussed previously, the longest length of stay was associated with "other specified manifestations" at 8.46 days, followed by diabetes with neurological manifestations at 7.87 days and peripheral circulatory disorders at 6.13 days. Diabetic ketoacidosis accounted for the most hospitalizations in this group.

Table 13: KEHP 2015 Diabetes Hospital Admissions (Source: Truven Health Analytics)

	Admits	ALOS	Net Pay Med and Rx*	Allowed Amount**
Diagnosis Principal w Code				
Diabetes Mellitus without complication	18	2.22	$139,110	$158,499
Diabetes with other specified manifestations	59	8.46	$1,028,664	$1,097,982
Diabetes with neurological manifestations	15	7.87	$283,234	$289,746
Diabetes with ketoacidosis	70	2.60	$514,862	$607,697
Diabetes with peripheral circulatory disorders	8	6.13	$143,891	$149,684
Diabetes with unspecified complications	2	1.50	$11,118	$14,644
Diabetes with renal manifestations	3	4.67	$27,320	$51,762
Diabetes with hyperosmolarity	9	2.44	$45,361	$62,981
Total			$3,222,227	$3,530,981

* Net Payment is the net amount paid for all claims. The amount after all contractual adjustments, deductibles, copays, and coinsurance.
** Allowed Amount is the amount of submitted charges after applying contractual adjustments.

Medicaid Hospitalizations for Diabetes

Table 14 indicates that Medicaid members had almost 3,500 hospitalizations in which diabetes was the primary diagnosis during SFY 2015. Nearly half of those hospitalizations were for Diabetic Ketoacidosis (DKA) (1,625 or 47%). The longest lengths of stay are associated with Peripheral Circulatory Disorders (8.0 days), Renal Manifestations (7.5 days), and Other Manifestations (6.6 days).

Table 14: SFY 2015 Medicaid Inpatient Admissions with Primary Diagnosis of Diabetes (adults and youth combined)					
Diabetes Primary diagnosis	**Total Spend**	**Unduplicated Number of Utilizers**	**Number of Admissions**	**Total Covered Days**	**Average Length of Stay (Days)**
Diabetes with Ketoacidosis	$5,044,071	987	1625	4642	2.9
Diabetes with Other Manifestations	$4,471,511	660	816	5359	6.6
Diabetes with Neurologic Manifestations	$1,992,412	276	351	1698	4.8
Diabetes Peripheral Circulatory Disorders	$1,244,329	134	150	1202	8.0
Diabetes with unspecified Complications	$1,014,411	289	307	770	2.5
Diabetes with Hyperosmolarity	$351,030	112	119	394	3.3
Diabetes with Renal Manifestations	$200,430	35	35	263	7.5
Diabetes Ophthalmic Manifestations	$24,921	3	3	10	3.3
Diabetes Other Coma	$7,417	4	4	14	3.5
Grand Total	$14,469,582	NA	3446	14,448	4.19

Table 15 shows hospitalizations for Medicaid members in which diabetes was indicated as either the primary or secondary diagnosis on admission. This data shows almost $200 million dollars in total spending by Medicaid for hospital care of members with diabetes. The 21,859 individual Medicaid members had 40,324 hospitalizations, meaning that there was an average of 1.8 hospitalizations for each person.

Table 15: All Kentucky Medicaid Inpatient Services and Costs for Patients with Diabetes as a Primary or Secondary Diagnosis Code on Admission			
Total Spend	**Number of Utilizers**	**Admission Count**	**Covered Days**
$199,091,412	21,859	40,324	204,756

Emergency Department Visits for Diabetes

Table 16 below shows the number and charges of ED visits for each ADD. It is important to recall that ED data covers only visits which DO NOT result in a full hospitalization; 23-hour observation stays are included in ED data. ED visits for diabetes produced billed charges of approximately $45 million in 2015. It is notable that there is a wide variation in the average charge for ED visits between different ADDs. The highes t average charges are seen in the Big Sandy and Kentucky River ADD, areas known to have among the highest rates of diabetes in the state.

Table 16: Emergency Department Encounters with Diabetes coded as the Primary Reason for the Admission
Source: Kentucky Inpatient Hospital Discharge Claims 2015
Primary Diagnosis = Any 250 - 250.99 (ICD9)
Primary Diagnosis = Any E10 - E13.x (ICD10)

Patient ADD	2015		
	Cases	Total Charges	Average Charges
PURCHASE	519	$1,695,221	$3,266
PENNYRILE	754	$2,430,286	$3,223
GREEN RIVER	611	$2,369,349	$3,878
BARREN RIVER	766	$2,322,248	$3,032
LINCOLN TRAIL	714	$2,039,174	$2,856
KIPDA	2,306	$9,870,758	$4,280
NORTHERN KY	836	$2,012,845	$2,408
BUFFALO TRACE	116	$355,124	$3,061
GATEWAY	363	$1,076,660	$2,966
FIVCO	535	$1,700,552	$3,179
BIG SANDY	615	$3,406,855	$5,540
KY RIVER	551	$2,809,272	$5,098
CUMBERLAND VALLEY	999	$3,422,960	$3,426
LAKE CUMBERLAND	687	$2,322,348	$3,380
BLUEGRASS	2,228	$7,541,995	$3,385
Total	12,600	$45,375,647	$3,601

Medicaid – Diabetes and ED Use

Table 17 demonstrates ED use by Medicaid members with a primary diagnosis of diabetes in SFY 2015. The "Member Count" column represents unduplicated members. The "Total Visits" shows that there were Medicaid members with diabetes who presented to the ED more than once in that year.

Table 17: SFY 15 Kentucky Medicaid Diabetes Population Emergency Department Utilization (Primary Diagnosis of Diabetes) By Area Development District

ADD	Member Count	Total Visits	Total Spend	Total Charged
Barren River	228	328	$ 111,183	$ 811,060
Big Sandy	204	272	$ 125,712	$ 1,166,222
Bluegrass	588	885	$ 369,768	$ 2,559,654
Buffalo Trace	43	56	$ 12,779	$ 114,484
Cumberland Valley	383	506	$ 199,837	$ 1,296,659
FIVCO	164	236	$ 60,098	$ 564,747
Gateway	118	176	$ 74,438	$ 460,042
Green River	177	248	$ 147,097	$ 837,006
Kentucky River	224	314	$ 170,674	$ 1,310,271
Kentuckiana	599	843	$ 298,269	$ 3,339,255
Lake Cumberland	277	382	$ 129,099	$ 1,058,029
Lincoln Trail	199	277	$ 85,469	$ 797,304
Northern Kentucky	241	356	$ 151,677	$ 832,744
Pennyrile	203	295	$ 167,898	$ 927,465
Purchase	146	221	$ 78,944	$ 579,171

Diabetes Comorbidities, Complications, and Costs Relative to other Chronic Diseases

Diabetes Comorbidities and Risks for Complications

It is important to remember that diabetes does not exist in a vacuum as people with diabetes often have chronic illnesses that impact their ability to self-manage, thereby presenting diabetes management challenges to their provider. KyBRFS 2015 data shows that people with diabetes often have other types of chronic diseases which can complicate self-care and medical care for this population. For example, arthritis symptoms may limit a person's capacity to use physical activity as a method of improving their blood sugar control. Arthritis in the hands can also affect the person's ability to provide self-care including taking medication and injecting insulin. Corticosteroids used to control asthma and COPD can make blood sugar control more difficult. Uncontrolled high blood pressure, with or without uncontrolled blood sugar, may lead or contribute to, very serious complications including blindness, kidney disease, heart disease, peripheral artery disease, and lower extremity amputations.

Among people with diabetes in Kentucky:

- 55.9% have arthritis;
- 21.9% have asthma;
- 18.3% have coronary artery disease;
- 61% are obese;
- 67.4% have high cholesterol levels;
- 75.8% have high blood pressure;
- 76.1% have had at least one permanent tooth extracted;
- 27.7% have had ALL their natural teeth extracted;
- 21.5% have diabetic retinopathy;

One piece of promising news about diabetes outcomes is related to kidney disease. Due to earlier diagnosis and improved treatments, the rate of end-stage kidney disease among those with diabetes has declined substantially since 2000. Analysis of end-stage renal data by CDC shows that like the rest of the nation, Kentuckians with diabetes are experiencing substantially lower rates of end-stage renal disease over the past decade.

Recent research has identified a clear link between diabetes and colon cancer. Those with diabetes have a 30% higher death rate from colon cancer than those without diabetes. In addition, diabetes makes cancer treatment more challenging due to the adverse effects of cancer treatment such as anorexia, nausea, and weight loss. Furthermore, acute diabetes complications, such as severe hyperglycemia, may delay cancer treatment.

Unhealthy behaviors can put those with diabetes at greater risk for complications. Forty-seven percent of persons with diabetes report no leisure time physical activity compared to 30.2% of those without diabetes (2015 KyBRFS). Those with diabetes who smoke are at higher risk for serious complications including: heart and kidney diseases; poor blood flow in the legs and feet which can lead to infections, ulcers, and possible amputations; retinopathy which can cause blindness; and neuropathy (damage to nerves) in the arms and legs causing numbness, pain, weakness, and poor coordination. Unfortunately, the smoking rate for those in Kentucky with diabetes is the same as that for the population overall at 26%.

Perhaps the most common complication of uncontrolled diabetes is cardiovascular disease. The combination of diabetes with high blood pressure and high cholesterol are directly tied to increased rates of cardiovascular diseases such as heart attacks and stroke. In fact, 65% of those with diabetes will die of cardiovascular complications of the disease.

Table 18 illustrates the relationship between diabetes and cardiovascular conditions that result in hospitalization. In approximately 38% to 51% of hospitalizations for which hypertension, ischemic heart disease, congestive heart failure, or cerebrovascular disease is coded as the primary reason for hospitalization; diabetes was coded as a secondary/contributing cause of the hospital stay. Such diabetes-related cases incurred charges of nearly $1 billion during calendar 2015.

Table 18: Kentucky Hospitalizations Due to Cardiovascular Diseases for those With and Without Diabetes

Cardiovascular Complication	2015				
	With Diabetes		Without Diabetes		% of Discharges with Diabetes
	Number of Discharges	Total Charges	Number of Discharges	Total Charges	
Hypertensive Disease	1,776	$66,635,334	2,191	$82,571,117	45%
Ischemic Heart Disease	7,721	$554,672,272	10,615	$742,505,166	42%
Congestive Heart Failure	8,469	$288,489,721	8,190	$290,087,741	51%
Cerebrovascular Disease	5,185	$232,306,103	8,394	$432,007,877	38%
Total	17,966	$909,797,327	20,996	$1,115,164,024	46%

Diabetes and other chronic diseases often result in costly hospitalizations. Table 19 depicts the number of hospitalizations due to diabetes and other common chronic diseases, the average charge for those hospital stays, and the total charges by disease. The medical conditions that result in the most expensive hospitalizations are cardiovascular conditions which are strongly related to diabetes: coronary heart disease, hypertension, and congestive heart failure. Diabetes has the fourth highest average cost for individual hospitalizations at $29,281.

Table 19: Kentucky 2015 Inpatient Discharges for Chronic Diseases (Source: Kentucky Inpatient Hospital Discharge Claims Calendar year 2015; Cabinet for Health and Family Services, Office of Health Policy)

Chronic Disease	2015		
	Cases	Average Charges	Total Charges
Coronary Artery Disease	15,272	$71,130	$1,086,304,776
Hypertension	3,967	$37,612	$149,206,450
Congestive Heart Failure	16,659	$34,731	$578,577,462
Diabetes	9,192	$29,281	$269,148,739
COPD	15,846	$22,702	$359,740,711
Asthma - Adult	2,841	$20,227	$57,466,006

Kentucky Employees' Health Plan Costs for Diabetes and other Chronic Diseases

Table 20 compares the cost of hospitalization for diabetes and other common chronic diseases among the KEHP adult population. The highest cost condition is cancer followed by chronic back conditions, osteoarthritis, coronary heart disease, and diabetes.

It should be noted that this table reflects only hospitalization costs and medications taken during the hospital stay for diabetes and other co-morbidity issues and does not include pharmacy costs by members who receive prescriptions on an outpatient basis.

Table 20: KEHP Hospitalization Comparison of Diabetes and Other Chronic Conditions in Adults for 2015			
Condition	**Patients**	**Net Pay Med and Rx**	**Net Pay per Patient**
Cancer	18,451	$11,136,523	$11,070
Chronic Back	41,584	$50,614,821	$8,763
Osteoarthritis	20,098	$105,213,761	$5,702
Coronary Artery Disease	5,776	$110,320,186	$5,489
Diabetes	18,059	$97,747,027	$5,413
Hypertension, Essential	45,252	$20,646,141	$4,730
Bariatric treatment of Overweight/Obesity	4,365	$21,645,707	$4,594
Congestive Heart Failure	1,006	$22,158,894	$3,643
Chronic Obstructive Pulmonary Disease(COPD)	4,712	$127,935,832	$3,077
Asthma	6,082	$104,278,226	$2,304

Table 21, shows comparative costs for common chronic conditions among children covered by KEHP. The most costly condition in terms of per patient costs is cancer, followed by diabetes. When considering total costs, asthma is the most costly followed by cancer and then diabetes.

Table 21: KEHP: Comparison of Diabetes and Other Chronic Conditions in Children for 2015			
Condition	**Patients**	**Net Pay Med and Rx**	**Net Pay per Patient**
Cancer	117	$2,787,239	$23,822
Diabetes	349	$2,450,728	$7,022
Osteoarthritis	97	$338,655	$3,491
Hypertension, Essential	116	$293,299	$2,528
Overweight/Obesity	225	$368,519	$1,637
Asthma	2,635	$3,439,624	$1,305
Chronic Obstructive Pulmonary Disease(COPD)	455	$392,981	$863

Medicaid Costs for Diabetes and other Chronic Diseases

Table 22 shows that diabetes was the third most costly chronic condition in SFY 2015 among Medicaid members.

Table 22: Kentucky Medicaid Chronic Condition Summary, Medical Claims Only; Dates of Service in SFY 15

Chronic Condition	Total Spend	Member Count	Claim Count	Ranking by Total Spend	Ranking by Member Count	Ranking by Claim Count
Hypertension	$ 391,723,497	260,419	1,382,703	1	1	1
Substance Use Disorder	$ 284,798,681	221,716	830,004	2	2	4
Diabetes	$ 283,690,764	117,706	1,041,257	3	7	2
Alzheimers and Related Disorders	$ 267,946,391	17,322	163,964	4	17	15
Chronic Kidney Disease	$ 240,731,848	46,766	355,681	5	12	9
Chronic Obstructive Pulmonary Disease and Bronchiectasis	$ 229,523,548	143,137	815,158	6	5	5
Depression	$ 203,648,101	162,644	830,946	7	4	3
Ischemic Heart Disease	$ 181,546,935	57,179	282,585	8	11	12
Heart Failure	$ 162,461,962	32,803	226,417	9	13	14
Anemia	$ 146,357,520	76,314	326,270	10	9	11
Rheumatoid Arthritis Osteoarthritis	$ 131,645,614	121,548	474,018	11	6	7
Hyperlipidemia	$ 109,115,846	165,620	545,063	12	3	6
Stroke/Transient Ischemic Attack	$ 96,584,993	17,825	121,464	13	16	16
Asthma	$ 94,602,648	115,023	367,852	14	8	8
Autism Spectrum	$ 82,024,122	10,489	336,784	15	21	10
Acquired Hypothyroidism	$ 55,994,582	63,236	231,905	16	10	13
Acute Myocardial Infarction	$ 36,278,756	5,446	15,828	17	24	27

Lung Cancer	$ 28,115,936	3,893	63,800	18	26	18
Hip/Pelvic Fracture	$ 27,838,359.94	4,018	24,743	19	25	26
Female / Male Breast Cancer	$ 27,566,376.11	5,780	61,599	20	23	19
FIBROSIS OR CIRRHOSIS OF LIVER	$ 21,084,782	18,811	57,863	21	15	20
Colorectal Cancer	$ 20,538,979	3,142	38,698	22	27	22
Osteoporosis	$ 20,457,323	11,795	34,019	23	20	23
Hepatitis	$ 18,383,752	15,618	40,002	24	18	21
Cataract	$ 17,378,008	26,886	66,040	25	14	17
Benign Prostatic Hyperplasia	$ 7,667,014	10,226	25,056	26	22	25
Prostate Cancer	$ 5,838,510	1,743	14,270	27	28	28
Glaucoma	$ 5,132,995	13,577	25,244	28	19	24
Malignant Neoplasm of Liver	$ 3,184,220	615	4,537	29	30	29
Endometrial Cancer	$ 2,525,901	773	4,443	30	29	30
Liver Transplant	$ 1,216,296	305	3,950	31	31	31

Conclusion

The data presented in this section has shown that diabetes is a common and costly disease in the Commonwealth. We also know that type 2 diabetes is both preventable and controllable. Prevention and control/management of diabetes is key to controlling the financial cost of this disease, and more importantly, increasing quality of life for those living with this chronic illness. The next section of the report will review information about how diabetes is best prevented or controlled/managed, and the efforts of each contributor to this report to apply this knowledge to battle the Kentucky diabetes epidemic.

Section 2 – Addressing Diabetes in Kentucky

Proven Approaches

As illustrated in the previous section, diabetes is a Common, Serious, and Costly disease; however, it is also Controllable and in the case of type 2 diabetes, can be Preventable. There is solid evidence base around both the prevention of diabetes (type 2) and control of diabetes as illustrated below.

Prevention of Diabetes

Preventing diabetes is a critical element of addressing the diabetes epidemic in the Commonwealth and the nation. The Diabetes Prevention Program study showed that those at high risk for diabetes, including those with prediabetes, can reduce their risk of developing diabetes by 58% (71% in those over 60 years of age) with structured lifestyle change programs such as the Diabetes Prevention Program (DPP). Research has also found that even after 10 years, people who completed a diabetes prevention lifestyle change program were one-third less likely to develop type 2 diabetes. To learn more about the DPP, visit www.cdc.gov/prevention.

Diabetes Control

Complications from diabetes are debilitating and have huge costs – both human and financial. These complications include blindness, kidney damage, lower extremity amputations, heart disease, stroke, and gum disease. There is strong science that shows that good control of the ABC's (**A**1C, **B**lood Pressure, and **C**holesterol) can dramatically improve outcomes in people with both type 1 and type 2 diabetes. For example:

- Reducing A1C (a measure of blood glucose control) by one percentage point can reduce the risk of eye, kidney, and nerve diseases by 40%.
- Controlling blood pressure can reduce the risk of heart disease and stroke by 33%–50% and the risk of eye, kidney, and nerve diseases by 33%.
- Improving control of low-density lipoprotein (LDL) cholesterol can reduce cardiovascular complications by 20%–50%.

Application of clinical care recommendations, also known as "Preventive Care Practices," is essential to achieving diabetes control and improving outcomes. These recommendations/practices are updated annually and disseminated by the American Diabetes Association (ADA). The recommendations include screening, diagnostic, and therapeutic actions that are known or believed to favorably affect health outcomes of patients with diabetes. They include things such as:

- Measuring blood pressure at every visit;

- Checking feet for sores and providing a thorough foot exam at least once a year;
- Conducting laboratory testing such as A1C at least twice per year, as well as kidney function tests, and cholesterol tests;
- Immunizing against flu, pneumococcal disease, and hepatitis B per guidelines;
- Referrals for preventive exams such as:
    - a dental checkup twice a year and
    - a dilated eye exam once a year; and
- Providing/Referring for Diabetes Self-Management Education.

These standards can be difficult to achieve within a health care system designed for more acute, episodic care as opposed to ongoing chronic care. Also, while critical, clinical care alone is not enough to manage a complex chronic disease like diabetes. A host of other risk reduction strategies, behavior changes/self-management, and support are necessary to achieve diabetes control and avoid short and long-term complications of the disease. One of the most important is Diabetes Self-Management Education and Support (DSME). The ADA Standards of Care note that "High-quality DSME has been shown to improve patient self-management, satisfaction, and glucose control. National DSME standards call for an integrated approach that includes clinical content and skills, behavioral strategies (goal setting, problem solving), and engagement with psychosocial concerns."

"Diabetes Self-Management Education (DSME) is the process of teaching people how to manage their diabetes. The goals of DSME are to control blood glucose, blood pressure, and cholesterol; to prevent complications that result from diabetes; and to provide people with diabetes with the best possible quality of life."

The most recent version of the *National Standards for Diabetes Self-Management Education*, released in 2012 and supported by the American Association of Diabetes Educators (AADE) and the ADA, note that DSME is a "critical element of care for all people with diabetes and is necessary to prevent or delay the complications of diabetes." The standards also acknowledge that the implementation and maintenance of these behavior changes make ongoing support, after the educational service, critical for success.

In 2015, the ADA, the AADE, and the Academy of Nutrition and Dietetics (AND) released a joint position statement on DMSE in type 2 diabetes. In addition to the benefits of DSME, the statement identified four critical times to assess, provide, and adjust DSME: 1) with a new diagnosis of type 2 diabetes, 2) annually for health maintenance and prevention of complications, 3) when new complicating factors influence self-management, and 4) when transitions in care occur.

Other Diabetes Prevention and Control Recommendations

Community Preventive Services Task Force

The *Guide to Community Preventive Services* is a resource for evidence-based recommendations and findings about what works in public health. The Community Preventive Services Task Force, an independent group established by the U.S. Department of Health and Human Services to examine the evidence and produce findings and recommendations about effective and ineffective programs, services, and policies, produces the Guide. The Guide recommends DSME as an effective and cost efficient way for persons with diabetes to learn to improve blood sugar control, improve quality of life, and prevent complications.

The Guide also recommends case/disease management programs as effective strategies .
In July 2014, the Community Preventive Services Task Force also recommended "combined diet and physical activity promotion programs for people at increased risk of type 2 diabetes and newly diagnosed diabetes" as an effective intervention for diabetes prevention and control.
For more information about these findings visit www.thecommunityguide.org/topic/diabetes .

US Preventive Services Task Force

The U.S. Preventive Services Task Force (USPSTF) is an independent, volunteer panel of national experts in prevention and evidence-based medicine. The Task Force works to improve the health of all Americans by making evidence-based recommendations about clinical preventive services such as screenings, counseling services, and preventive medications.
Recommendations are published on the Task Force's Web site and/or in a peer-reviewed journal. In 2015, USPSTF updated their 2008 recommendation on screening for diabetes in asymptomatic adults. "The USPSTF recommends screening for abnormal blood glucose as part of cardiovascular risk assessment in adults aged 40 to 70 years who are overweight or obese. Clinicians should offer or refer patients with abnormal blood glucose to intensive behavioral counseling interventions to promote a healthful diet and physical activity."
https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/screening-for-abnormal-blood-glucose-and-type-2-diabetes?ds=1&s=diabetes

Agency for Healthcare Research and Quality (AHRQ)

New publications from the *Agency for Healthcare Research and Quality (AHRQ)* summarize the effectiveness of behavioral programs to supplement clinical care for people with type 1 and type 2 diabetes. The publications, developed for clinicians and consumers, reflect findings of an AHRQ-funded systematic review that examined behavioral programs for diabetes self-management, including patient education, dietary interventions, and structured exercise or physical activity interventions. Findings show, for example, that people with type 1 diabetes who participated in behavioral programs had greater reductions in hemoglobin A1C levels at 6 months, but that more research is needed to know if reductions can be sustained for 12 months

or longer. For people with type 2 diabetes, 11 or more hours of behavioral programs resulted in improvements in glycemic control. See www.ahrq.gov/ for more information.

How is Kentucky Doing?

Data on how well Kentuckians with diabetes fare in meeting clinical and self-care measures is noted in Table 23. Kentucky meets or exceeds the national rate in two key measures: rates of flu and pneumonia vaccinations and annual dilated eye exams (highlighted in yellow), but there is much more work to be done.

One significant area of opportunity for improvement is increasing the percentage of people who have participated in diabetes self-management education (DSME). Noting the critical importance of this intervention, it is highly significant that only half of those with diabetes in Kentucky report ever having had formal self-management education. Some progress has been made in increasing access to DSME programs in Kentucky (see the "Current Efforts" section of this report), but there is much more work to do.

Table 23: Reported Rate of Diabetes Care Practices Among Adults with Diabetes, Kentucky and US

Preventive Care Practice	KY 2015	US 2013
Received a Professional Foot Exam	72.4%	73.0%
Annual Dilated Eye Exam	67.3%	62.2%
Received 2 or more A1C's Past Year	74.1%	78.6%
Received a Flu Shot Past Year	59.8%	53.6%
Ever Received Pneumonia Shot	61.4%	55.6%
Performs Daily Self Foot Exam	63.5%	70.7%
Daily Self Blood Glucose Monitoring	62.8%	70.4%
EVER had Self-Management Education	48.0%	51.3%
Dental Visit in the past year	53.9%	UNK

Source: KyBRFS and http://www.cdc.gov/brfss/data_tools.htm

Kentucky has also made significant progress in promoting and scaling the DPP in the Commonwealth since 2012; however, there are still only 55 sites offering the program (as of December, 2016) – not nearly enough to address the almost 1 million Kentuckians estimated to need this intervention. See the "Current Efforts" section of this report for more information about the DPP.

No one person, agency, organization, or association can successfully address the epidemic of diabetes or achieve the Institute for Health Care Improvement Triple Aim Goals of Better Health, Better Care, and Better Value alone. Improving diabetes outcomes and preventing

diabetes will take a concerted effort by policy-makers, healthcare providers, educators, public and private health plans, employers, individuals with diabetes, public health, technology resources, communities, and more. Applying evidence-based strategies – at an appropriate dose, for prevention, detection, and management of diabetes within a health care delivery system that supports and provides continuous, proactive, planned, patient-centered and population-based care is critical to success.

Current Diabetes Efforts

The Department for Public Health, Office of Health Policy, Department for Medicaid Services, and Personnel Cabinet – Kentucky Employees' Health Plan support a number of interventions related to diabetes for their respective populations. A summary of these efforts, by agency, is provided below.

Personnel Cabinet - Kentucky Employees' Health Plan

The Kentucky Employees' Health Plan (KEHP) is a self-funded program providing health insurance benefits to employees and retirees under the age of 65. This includes state employees, local school boards, and various cities and county governmental agencies. KEHP offers health insurance coverage to approximately 225,497 employees, retirees, and their dependents. KEHP partners with Anthem Blue Cross and Blue Shield as the medical third-party administrator: Anthem's Integrated Health Model (IHM) to oversee medical management; HumanaVitality® as the incentivized wellness provider; and CVS/Caremark as the pharmacy benefits manager.

In 2015, approximately 18,482 members of KEHP had diabetes with an average treatment cost of $4,076. Diabetes is the most costly condition to KEHP with almost $70 million in medical and prescription drug costs.

Anthem's Integrated Health Model

Using a powerful clinical engine, the Integrated Health Model includes case management, integrated behavioral health strategies, and Kentucky based, KEHP-dedicated Utilization Management (UM) nurses.

Anthem's approach to improving the health and well-being of KEHP members includes a comprehensive, highly customized care management model, but it starts with a simple idea: enhance the coordination and quality of the care provided.

With IHM, KEHP members have access to a unique model, unlike traditional disease management programs. Anthem's multi-disciplinary teams of health care professionals are managing KEHP members in a holistic approach versus a single disease state. These professionals include a medical and behavioral health director, nurses, health coaches, educators, social workers, dietitians, and pharmacists. Together they provide guided support to help find the right care at the right time.

Holistic Clinical Management

With IHM, Anthem supports KEHP members' needs related to their overall health, including

clinical support associated with their complex and chronic conditions and case management activities. KEHP members receive a single point of contact for UM and case management as well as seamless transition to the right care management program for their needs. Anthem's clinical model is enhanced by combining the benefits of co-located, multidisciplinary clinical professionals overseeing all aspects of care – all in one place – and anchored by registered nurses, known as Personal Health Consultants (PHC), assigned at the family level. The PHC acts as a care coordinator for the KEHP member across the health continuum.

Anthem also provides a strategy for all participants with risk gradations that enable an outreach to more of the members identified. The clinical team tracks and monitors member-specific interventions by creating an individualized Care Plan for each identified member.

Engagement

Engagement includes involving KEHP members in all aspects of the case management process. Anthem engages members through outbound calls made by the PHC who contacts members, families/caregivers, the treating physician, and other providers, as needed, to collaboratively address identified health and care coordination needs. The integrated multi-disciplinary team supports the PHCs, providing a total solution.

Anthem has developed two distinct engagement tracks which direct the outreach, interventions, and coordination of care based on identified needs:

- Short-term: Focuses on getting a member back on course by offering guidance and support. For example, PHCs provide assistance by finding a participating provider or closing a gap in care.

- Long-term: Ongoing support for those that are chronically ill with higher risk scores and potential for future high costs.

Anthem also supports the physician/patient relationship, and plan of care while empowering members to become more effective managers of their own health. Condition-specific actionable materials reinforce program interventions and further assist members in controlling their conditions and achieving a positive state of health.

Reporting

Anthem provides KEHP with IHM reporting, to measure the success of the program. This includes trend improvements, Return on Investment (ROI) reporting, risk-segmentation reporting, user activity rates, and overall trend improvement. Anthem will provide integrated reporting for all

the services covered by IHM, including metrics, such as the following:

- Case identification and stratification;
- Enrollment rate;
- Engagement rate;
- Cases under management
- Primary conditions under management;
- Member contacts (# of calls, # of mailings);
- Contact activity, including telephonic contacts and compliance-issue alert mailings over the previous quarter and last 12 months;
- Top goals for members and providers;
- Summary of referrals for specialized staff and other resources;
- Top five teaching topics;
- 24/7 NurseLine utilization metrics, including most frequent 24/7 NurseLine caller symptoms and illnesses; disposition of 24/7 NurseLine calls; time of call; number of calls; topics discussed; number and type referrals; summary of translation line usage; and summary of membership volume and demographics;
- Gaps-in-Care alert and outreach activity metrics, including MyHealth Notes, provider mailings, critical alerts to physicians; MyHealth Note volumes; percentage of gaps-in-care alert types sent by response category; overall gaps-in-care alert volume per 1,000 compared to reference population; total gaps-in-care alert volume by type of alert; KEHP-specific member compliance for the most recent 12-month period; potential financial impact (included after the program has been in place for four quarters); and
- Maternity management utilization metrics, including assessment rate; birth weight, delivery type, gestational age; trimester at program registration; infant prematurity average length of stay; infant prematurity expense; maternity expense per member; maternity expense related to preterm complications per members; and neonatal intensive care (NICU) utilization and expense.

The IHM Program uses predictive modeling and multiple triggers to identify and proactively perform outreach to KEHP's highest at-risk population. Members are engaged in case management and, when applicable, routed to the most appropriate health management program.

Referral Management

Referrals for case management are generated from a variety of sources, including precertification or concurrent review activities, claims data analysis and review activities, case management programs, health risk appraisal survey results, physicians and other health care providers, and

members or their families/caregivers.

Clinical factors which may trigger a case management referral include, but are not limited to, the following:

- Inpatient readmissions;
- Health assessments;
- Predictive modeling;
- Inpatient utilization events;
- Catastrophic illnesses and injuries;
- Potential transplant candidates;
- First fill pharmacy triggers (e.g., hyperlipidemia and hypertension medications);
- Evidence-based guideline adherence/gaps in care;
- Real-time referrals;
- ER recidivism;
- Identified gaps in care; and
- 24/7 NurseLine utilization.

Personal Health Consultant – Episodic Care Management and Chronic/Complex Conditions

The PHC focuses on risks, not just conditions, and serves as the single point of contact for members throughout the entire episode of care. A PHC provides care coordination and resources through inpatient events and condition management.

- The KEHP member and PHC establish goals together at the individualized member's pace.
- A PHC can help the member identify barriers towards reaching goals
- A PHC can come up with strategies to help the member overcome barriers.
- A PHC speaks with different health professionals (Pharmacist, Registered Dietitian, etc.)
- A PHC can create a routine for taking medications.
- PHC and KEHP member implement strategies such as the PHC refers KEHP member to a Pharmacist who explains medications to member and helps find cost savings opportunities.
- PHC and KEHP member evaluate strategy outcome towards meeting goals. For example, a member states they have remembered to take their medications all week.
- PHCs help KEHP members with modifiable lifestyle changes to enhance the care received by physician.

Integrated Health Model for Diabetes

This model addresses comorbid conditions by evaluating their presence during the member's initial assessment, as well as on an ongoing basis. For example, if a member with diabetes also has coronary artery disease (CAD), Anthem will manage diabetes as the primary condition and also formally assess and monitor the member's CAD. In this situation, the focus on CAD management depends on its effect on the member's diabetes. Anthem will determine the primary condition by severity -- the illness with the highest severity level is the member's primary condition.

Diabetes Prevention Program

In 2013, KEHP began a new program of recruiting and referring eligible members to a Diabetes Prevention Program and in 2014 offered the benefit to all members who met program qualifications.

Beginning in 2015, KEHP partnered with Anthem to administer, manage, and expand the DPP. Anthem provides system-driven logic for class referrals based on member demographics. Anthem has combined the use of its analytics and data-mining capabilities to identify "at risk" members for the DPP within the KEHP population. Once members have been identified, Anthem's team of PHCs and clinical staff refer KEHP members to specific DPP classes in their community. Referrals are based on both systemic triggers from claims data as well as member interaction with PHCs. Customer Service associates are also trained to support program awareness.

The DPP benefit is available at no cost to KEHP members who have prediabetes or are considered at a high risk of developing diabetes. The Centers for Disease Control and Prevention (CDC) established eligibility guidelines for participation in a DPP which includes the following:

Participants must be 18 years of age or older, have a body mass index (BMI) of ≥24 kg/m2 (≥22 kg/m2, if Asian), and confirm eligibility by one of two ways:

A member must have a recent (within the past year), documented blood test (may be self-reported) or diagnostic test indicating prediabetes or have a history of gestational diabetes mellitus (GDM), according to one of the following specifications:

- Fasting plasma glucose of 100 to 125 mg/dl;
- Plasma glucose measured 2 hours after a 75 gm glucose load of 140 to 199 mg/dl;
- A1C of 5.7 to 6.4;
- Clinically diagnosed GDM during a previous pregnancy (may be self-reported); or
- Member screens positive for pre-diabetes based on the CDC pre-diabetes Screening Test, the American Diabetes Association's type 2 Diabetes risk test or a claims-based risk test.

All DPP organizations offering classes are CDC-recognized and trained certified lifestyle coaches facilitate classes. DPP classes are primarily offered by various Kentucky hospitals, local health departments, and YMCAs. As the interest, demand and reimbursement in the program grows, additional provider organizations are applying for CDC recognition and more classes are being made available. The DPP participants meet in-person as a group with a lifestyle coach, once a week for an hour. Approximately 16 sessions are completed during the first six months. Participants then attend at least six monthly sessions (a total of at least 22 sessions for the year-long program). The support of the trained lifestyle coach and year-long program has been found effective in helping members incorporate lifelong behavioral changes such as losing weight, being more physically active, and managing stress.

KEHP's DPP enrollment continues to grow. In 2015, 375 KEHP members participated in a DPP class. The number of DPP providers grew with 23 providers offering 62 classes in 21 counties. Early tracking results indicate the program is producing positive results. KEHP members participating in DPP classes are losing weight, increasing physical activity, and reducing blood sugar levels at or below CDC recommended levels. DPP data from KEHP enrollees (January through October 2015) shows that the 307 members who participated in DPP cost the plan $34 per month compared to the almost 18,000 enrollees with Type 2 diabetes who incurred average costs of $356, suggesting significant savings can be achieved.

Funding

The KEHP is a self-insured health plan and receives employer and employee contributions into the KEHP Trust Fund for the overall operation of the plan. The employer contributions are allocated from the state's General Fund, and all claims and administration costs associated with KEHP operations are paid from the KEHP Trust Fund. There are no funds specifically earmarked by the General Assembly for disease management programs or the administration of the KEHP. The KEHP expends less than 5% of its overall budget on administration costs.

Anthem Health Guide – Dynamic, Interactive Concierge Member Service

Anthem Health Guide (AHG) is a full-service, high touch support program that exceeds the care traditionally provided to members. KEHP-dedicated member customer service associates and clinical/wellness coaching are integrated through multi-channel technology that incorporates speech analytics (specific verbalization will prompt questions or transfers to the IHM clinical team) and automated engagement triggers (gaps in care, predictive modeling, etc.) to deepen members' engagement in their own total well-being. KEHP members connect with Anthem directly via phone, web-chat, mobile chat, secure e-mail, or they may request a call-back from an associate directly via Anthem's consumer portal.

Identification triggers in the medical management system are developed using specific diagnosis codes and/or CPT procedure codes based on utilization trends and patterns, network considerations, and medical management initiatives.

Associates utilize *smart engagement* technology. This includes speech analytics/triggers that identify the member and transfer the member to clinical team:

- Maternity;
- Diabetes;
- Oncology;
- Musculoskeletal;
- ESRD;
- Asthma;
- COPD;
- Depression;
- Heart Failure; or
- CAD.

Custom speech triggers include:

- Childhood obesity;
- Why Weight KY; and
- Diabetes Prevention Program (DPP)

Vendor Collaboration

Anthem supports KEHP with their annual LivingWell Promise activities, primarily by accepting in-bound data feeds capturing HumanaVitality Health Assessments and Biometric results. This data compilation affords Anthem the opportunity to provide systemic support for member clinical management and outreach. Conversely, Anthem transmits outbound claim metrics for awarding KEHP members HumanaVitality points for adherence to preventive wellness checks, age-appropriate screenings, etc. DPP participation is also reported for member rewards. CVS/Caremark supports KEHP as the pharmacy benefits manager, while also promoting efforts to bring awareness to the prevention of and treatment of diabetes.

Diabetes Value Benefit

In 2016, KEHP started a Diabetes Value Benefit. Members with diabetes receive a reduced co-pay and co-insurance on diabetic prescriptions and supplies with no deductible.

Table 24: KEHP Diabetes Value Benefit

Diabetes Value Benefit*	LivingWell CDHP	LivingWell PPO	Standard PPO	Standard CDHP
30-Day Supply Tier 1 - Generic Tier 2 – Preferred Tier 3 –Non-Preferred	0% 10% 10%	$0 $25 $40	30% $0 Min $10-Max $40	0% 25% 25%
90-Day Supply (Retail or Mail Order) Tier 1 - Generic Tier 2 – Preferred Tier 3 - Non Preferred	0% 10% 10%	$0 $50 $80	30% $0 Min $20-Max $80 Min $90-Max $170	0% 25% 25%

*Maintenance diabetic prescriptions and supplies covered under the Diabetes Value Benefit must be a covered prescription on the maintenance drug list.

Table 25 shows the comparison between the First Quarter of 2015 to the First Quarter of 2016. KEHP's total diabetic prescription utilization increased by 9%, but the member's out-of-pocket decreased from 20% to 7%. The biggest increase in utilization was found in the Consumer Driven Health Plans because prescriptions and supplies bypassed the deductible. Across all of KEHP's plans, members paid less out-of-pocket in 2016 when compared to 2015.

Table 25: KEHP's Diabetes Prescription Utilization

Plan	Jan - Mar 2015		Jan – Mar 2016		Utilization Increase
	Scripts Per Member	Out-of-Pocket	Scripts Per Member	Out-of-Pocket	
LivingWell CDHP	0.065	54%	0.079	11%	21%
LivingWell PPO	0.179	8%	0.191	5%	7%
Standard CDHP	0.043	73%	0.052	24%	22%
Standard PPO	0.125	13%	0.138	9%	10%
Total	**0.114**	**20%**	**0.124**	**7%**	**9%**

Department for Medicaid Services (DMS)

Beginning in July 2014, the Kentucky Department for Medicaid Services (DMS) was almost completely transitioned to a statewide managed care environment with the exception of a small number of members. The purpose of this transition was to make more efficient use of limited

resources and improve the care coordination of Medicaid members. Each of the managed care organizations (MCOs) strives to work with a member's healthcare provider to improve the quality of the services they receive. With the expansion of Medicaid in 2014, DMS has also worked with managed care organizations to integrate both physical and behavioral health care. During this reporting period, DMS had five MCOs that served Kentucky's Medicaid members.

Each MCO is required to conduct a health risk assessment for their new members within 90 days to identify any health needs of the member and improve outcomes by identifying health issues early. All MCOs have robust disease and case management programs that help Medicaid members manage their health condition.

Each of the MCOs is required to track and report on Healthcare Effectiveness Data and Information Set (HEDIS) measures. This includes several diabetes-specific HEDIS measures that will demonstrate each MCO's progress.

A brief overview of each MCO's diabetes program is below.

Anthem Medicaid:
Anthem Medicaid was the last MCO to provide services statewide and that occurred on July 1, 2014. Disease management eligible members are identified using case finding methodology, including a ranking by Gaps in Care (GIC) score. Gaps in care could include the lack of an A1C twice per year, nephrology screening at least once per year, and an annual retinal eye exam. General and condition-specific health risk assessments are administered telephonically by disease management case managers to identify comorbid conditions and other impacts on diabetes such as BMI or tobacco use. When a member is enrolled in a disease management program, provider notification is completed via phone or fax.

Approximately 95% of the eligible membership is currently enrolled in the diabetes disease management program. This includes both the active and passive levels of disease management, which occurs by sending education by mail, provider engagement, and direct member engagement.

CoventryCares (now Aetna Better Health):
CoventryCares provides care management services that include individual assessment, care plans with member centric goals, and assistance in obtaining necessary diabetes supplies. Lower risk diabetic members receive newsletters specific to diabetes. Care managers utilize an online repository for printing and mailing education materials. The Member Outreach team works extensively with organizations like the Kentucky Diabetes Network, Juvenile Diabetes Research

Foundation, and local diabetes prevention and education groups across the state. More details, including specific meetings attended that relate to diabetes support, can be found in the "Community Events" held each month. Several members of the Member Outreach team are also certified Chronic Diseases Symptom Management Program Trainers, which allows them to teach a 6-week course regularly in their communities that provides education on better management of chronic diseases. There are also three on the team that currently are working to become Diabetes Prevention Program trainers, certified through the CDC. These coordinators will offer DPP training in their communities by 2017. Their involvement, along with the wellness and prevention lead's simultaneous DPP training that the lead hopes to offer internally to Aetna staff, has earned this plan DPP Certification status through the CDC as well. The Quality program staff has provided training to the Case Management team regarding diabetes, nutrition, and weight management. Additionally, the Quality program has participated in meetings with the American Heart Association to help raise awareness to the community regarding nutrition/diabetes education. This topic has also been presented through the Voxiva text program, and members will be eligible to receive free text messages regarding diabetes management if they are enrolled in the program. There are currently 794 members diagnosed with diabetes who are in one of the phases of the case or disease management program.

Humana CareSource:

Humana – CareSource (HCS) has been working on a performance improvement project to improve the process of diabetes care among HCS Medicaid members. HCS believes that combined provider targeted and health organization interventions can facilitate structured and regular testing and review of A1C in a more effective and timely manner. When these interventions are coordinated with member-targeted interventions, the process will lead to better health and cost outcomes. There are four specific objectives: (a) to examine whether there were differences on demographic characteristics between the members with poorly controlled diabetes and those who are not; (b) to identify barriers and enablers of A1C management from perspectives of members, providers, and health plan system; (c) to redesign and implement multifaceted, evidence-based interventions based on the barrier analysis, clinical practice guidelines, and literature review; and (d) to evaluate the effectiveness of the newly implemented process on A1C control. This project will enable HCS not only to control A1C effectively, but also to develop best practices to achieve the goals of Healthy People 2020 and Healthy Kentuckians 2020.

Passport Health Plan (PHP):

Passport Health Plan is the MCO that has served Kentucky for the longest period of time. PHP has a robust disease and case management that strives to improve the outcomes for their members. Specifically, PHP has a Diabetes Care Program in which eligible members are passively

enrolled. Members may opt-out at any time. The purpose of this program is to improve outcomes for Passport members by initiating member engagement and using incentives. Passport's Diabetes Care Program uses a stratification system that identifies members as low-risk or high-risk. Community and provider engagement are also methods that PHP uses to address its diabetes membership. PHP identifies gaps in care and reports those so care managers can address these gaps. Approximately 99% of eligible PHP members participated in their diabetes program in 2015.

WellCare:

WellCare served the largest Medicaid membership for SFY 2015. Its Disease Management program includes diabetes management and is used to identify members and provide education, guidance, support, and health coaching to these members and/or their caregivers. It also seeks to empower members to make behavior changes, self-manage their condition, and make choices that will improve their health and quality of life.

WellCare uses a proprietary model to identify and stratify members each month for management. The model has several components including disease status identification, severity, cost, and utilization factors and places members in categories by risk which includes low, moderate, and high. Engagement activities vary among each risk category. A disease manager, who will conduct a comprehensive assessment to further stratify according to the member's clinical history, is assigned to program participants.

WellCare seeks to ensure its disease management program is culturally competent by identifying opportunities to remove linguistic/cultural barriers to availability and access to care, as well as training staff to promote a diverse and culturally competent environment.

Table 26 shows the total number of MCO members in Disease Management at the end of SFY 2015.

Table 26: Total Medicaid MCO Members in Disease Management

MCO	Membership as of 6/29/15	Number of Members enrolled as of 7/1/15	% of Members
Aetna (Coventry)	293,370	67,880	23.14%
Anthem	71,696	10,683	14.90%
Humana	115,980	9,478	8.17%
Passport	253,418	490	0.19%
WellCare	427,831	547	0.13%
TOTAL	**1,162,295**	**89,078**	**7.66%**

Department for Public Health (DPH)

The Kentucky Diabetes Prevention and Control Program (KDPCP) is a population-based public health initiative whose mission is to reduce the sickness, disability, and death associated with diabetes and its complications and to prevent new cases of type 2 diabetes. This work is accomplished through a network of state, regional, and local partners that expand the reach of diabetes prevention and control efforts across the Commonwealth, including local and district health departments, state and local coalitions, and multiple other key diabetes stakeholders. Visit www.chfs.ky.gov/Diabetes for more information about KDPCP.

Since the inception of the program, the Local Health Departments (LHDs) have been a major partner, providing critical infrastructure to reach people across the state. Funding is distributed to all LHDs for diabetes prevention and control efforts with guidance and priority activities provided by KDPCP.

Local and state coalitions are also major partners in the diabetes effort. The Kentucky Diabetes Network (KDN) is a coalition of over 250 members representing health plans, health care professionals and organizations, academics, businesses, public health workers, and many other stakeholders. This coalition is an incorporated, 501c-3 organization and has been active for 17 years. KDN's mission is to be the stewards for watchful and responsible care for those affected by diabetes in Kentucky. More information about KDN may be found at: www.KYdiabetes.net.

In addition to the state coalition, there are more than 45 local coalitions across the state with a diabetes focus. The KDPCP and local health department partners work closely with these coalitions to involve and empower strategic community members in a collaborative process of assessment and action plan development to address diabetes-related needs based on the community's own unique priorities, strengths, and weakness. Community members understand and love their community, so a grassroots strategy is encouraged to implement evidence-based actions and tactics by local community members, themselves, to reduce diabetes risks and improve people's lives. However, local health departments have been strongly encouraged to work with coalition partners to ensure access to DPP and DSME in their community. In addition, over the last two years as many as 34 coalitions were awarded mini-grants to promote community-wide messaging regarding prediabetes and risk factors for diabetes, utilization of lifestyle intervention programs, diabetes ABCs, and the importance of DSME attendance for individuals with diabetes. .

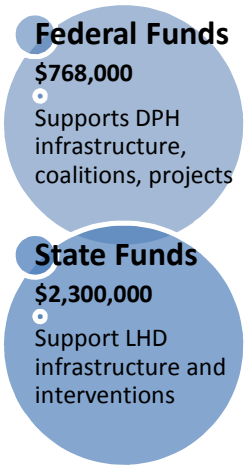
Collectively, the state and local health departments, the KDN, and many others work together to support and implement the KDPCP's key interventions and activities. Adult Kentuckians with, or at risk for, diabetes are the population of focus. In addition, African American, Hispanic/Latino,

senior, and Appalachian populations have diabetes-related disparities and are priority target audiences. Interventions include: community mobilization, public awareness, community group education, professional education, quality improvement, and surveillance with special emphasis given to implementation of strategies to increase access to, and participation in, evidence-based interventions such as Diabetes Self-Management Education (DSME) and the DPP.

- **Community Mobilization:** Create/Maintain active partnerships to jointly identify diabetes-related issues and solutions at the state and local level in communities and among health care professionals, persons with diabetes, those at risk for diabetes, and other key stakeholders.
- **Public Awareness:** Promote awareness of diabetes prevention and control to the general public via multiple venues, educational tools, etc.
- **Community Group Education:** Increase access to, and participation in, evidence-based group education classes (particularly those with national accreditation/recognition status) to educate and support people with diabetes to better manage their disease, and people at risk for diabetes to prevent/delay it. Current evidence-based programming includes:
    - Diabetes Self-Management Education (DSME); and
    - Diabetes Prevention Program (DPP).
- **Professional Education and Health System Quality Improvement:** Provide up to date continuing education for health care professionals as well as ongoing strategic communication, improvement processes, and tools to assist health care systems, providers, health plans, and other key stakeholders in serving people with diabetes and those at risk for diabetes.
- **Surveillance and Evaluation:** Monitor data to assess the impact of diabetes, plan appropriate interventions, and evaluate program efforts.

Funding:

CDC funds for diabetes prevention and control are included in the "State Public Health Actions to Prevent and Control Diabetes, Heart Disease, Obesity and Associated Risk Factors and Promote School Health" Cooperative Agreement. This includes funding to link and support programs through one grant. CDC funds related to diabetes are primarily used to support state-level diabetes personnel and operating costs, fund local diabetes



coalitions, support epidemiological and evaluation efforts, and add support to interventions.

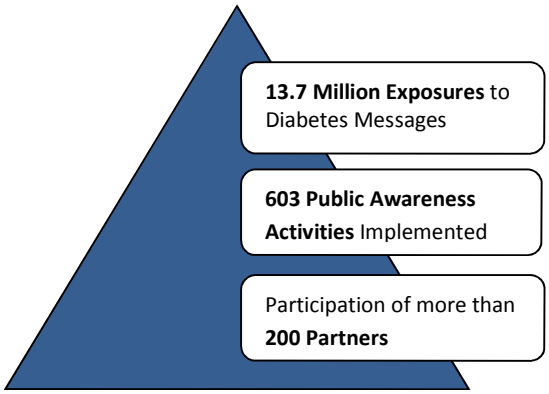
Kentucky has also been fortunate to have state general funds to support diabetes prevention and control efforts statewide. In SFY 15 and SFY 16, DPH has designated funds specifically for LHD diabetes prevention and control efforts. Program guidance associated with these funds supports evidence-based interventions and is in alignment with priorities in the federal grant, and this report.

Reach/Benefit/Effectiveness:

Education Efforts:

During SFY 15, KDPCP and local health departments delivered a variety of education efforts for persons with or at risk for diabetes, the community, and the general public. This was done via a variety of media, community events, presentations, and more. Figure 3 shows the estimated number, partner organizations, and reach of these programs/events.

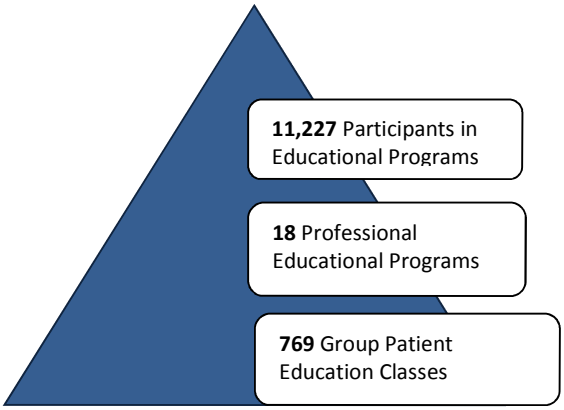
Figure 3 – FY 15 Diabetes Awareness Activities



In addition to public/community education, local health departments and their partners also delivered more intensive education to those with or at risk for diabetes. This includes comprehensive DSME, non-comprehensive education (example, *Diabetes Basics* and *Nutrition Basics*), support groups, and education to professionals who care for people with diabetes.

In 2015 and 2016, KDPCP and partners also planned and implemented very successful annual Diabetes Symposia during National Diabetes Month in November. Each of the events was attended by nearly 400 participants from several states and a variety of disciplines. In addition, over 30 exhibitors were present. Figure 4 shows the summary of these more intensive education programs and participants.

Figure 4 – FY 15 Diabetes Educational Programs



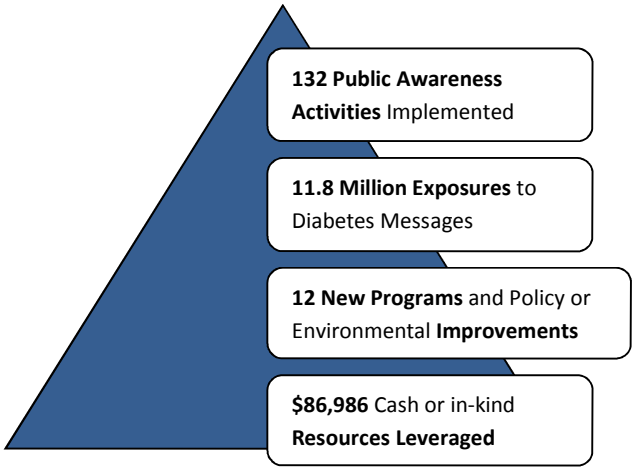
More detail about these key interventions is included below.

Coalition Efforts:

More than 45 coalitions with a diabetes focus have been working on one or more of the following evidence-based approaches and leveraged significant community resources for these efforts: community wide prediabetes and diabetes public awareness campaigns, promotion and support of environmental improvements and policies that support healthy choices, and initiation of new behavioral and social support programs.

Coalitions contributed a great deal to the education efforts/numbers noted above. Their specific contribution to these numbers is listed in Figure 5. In addition, it is important to note that coalition efforts generated approximately $86,986 in cash and/or in-kind resources to diabetes prevention and control efforts. This is just one measure of the effectiveness of these state and community partnership efforts.

Figure 5 – FY 15 Coalition Efforts



Key Interventions: Diabetes Prevention Program

KDPCP, along with many partners across the state, have been working hard to improve access to the DPP across the Commonwealth. A number of activities have been implemented including:

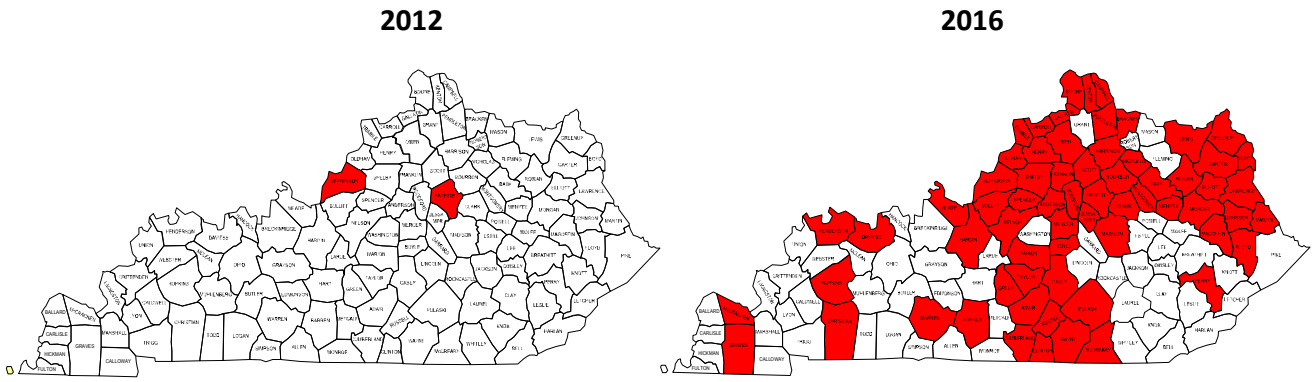
- Maintenance of a Diabetes Workgroup/Steering Committee;
- Ongoing maintenance and improvements to the web-based Diabetes Resource Directory – including listings of class locations, contact information, and, most recently, new classes;
- Work with KEHP and Anthem; and
- Formation of a KDN Diabetes Prevention workgroup.

This effort has resulted in a number of achievements, including:

- Third highest amount of registered organizations providing the DPP in the nation. (CDC, October, 2016);
- Tenth highest numbers of DPP participants in the U.S. (CDC, October, 2016);
- Inclusion of Kentucky's story in two CDC "Emerging Practices Documents" – one regarding referrals and one regarding coverage of DPP by state employee insurance. These can be found at: www.chfs.ky.gov/diabetes;
- Several national presentations; and
- Multiple requests from other states for sharing/assistance.

Figure 6 illustrates the progress made in expanding DPP coverage across Kentucky.

Figure 6: Kentucky Counties Covered by a Recognized Diabetes Prevention Program



While this represents great progress over a relatively short period of time, much more work is needed to continue the momentum that has been established and to reach the estimated 1 million Kentuckians in need of this intervention.

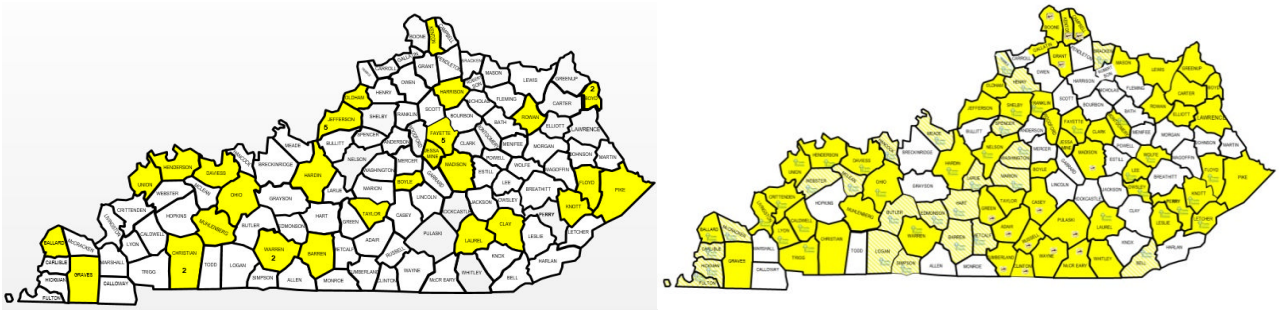
Key Interventions: Diabetes Self-Management Education (DSME)

KDPCP has provided DSME services through the LHDs for many years. More recently, specific focus has been placed on working with partners to increase access to, and utilization of, Accredited/Recognized DSME programs.

In January, 2016, the DPH received Accreditation from the American Association of Diabetes Educators (AADE) for their DSME program – "Healthy Living With Diabetes." This state level accreditation allows for the addition of "Branches" under its umbrella. As of December 1, 2016, 20 local health departments have joined the program and five have achieved full accreditation status. In 2012, 36 of Kentucky's 120 counties were covered by a recognized or accredited program, but in 2016, 62 counties are covered. See Figure 7.

Figure 7: Kentucky Counties Covered by a Recognized or Accredited Diabetes Self-Management Program

2012 **2016**



Healthy Living With Diabetes mission statement is**:** To empower individuals with diabetes to make knowledgeable, responsible choices and behavior changes regarding self-management of their diabetes.

Program Goals and Tracking of information:

- Provide caring, engaging, and evidence-based education in a public health setting;
- Improve access to quality accredited diabetes self-management education programs in Kentucky;
- Decrease the proportion of persons with diabetes with an A1c >9%;
- Seventy percent of participants will report meeting the ADA standard for dilated eye exams;
- Seventy percent of participants will report meeting the ADA standard for blood pressure;
- Ninety percent of participants will report attaining their individual learning goal;
- Seventy percent of participants will report some level of positive change in their individual behavioral change goal.

The program is in the process of reviewing this data for submission of the first year's outcomes of the four fully accredited sites. Preliminary information appears promising.

Miscellaneous Accomplishments:

- In addition to the CDC Emerging Practices documents mentioned previously, the *"Compendium of Effective Public Health Strategies to Prevent and Control Diabetes,"*

which highlights successful state diabetes prevention and control efforts, also includes Kentucky entries. The Compendium can be found at: https://stacks.cdc.gov/view/cdc/23434

- Actively supportive of the strong state coalition, the Kentucky Diabetes Network (KDN), consisting of over 250 state partners (in existence for 16 years)
- Annual statewide Diabetes Resource Assessment (DSME, DPP, support groups, coalitions, etc.) completed via LHDs
- Created/updated information for more than 900 entries in the web-based Kentucky Diabetes Resources Directory https://prd.chfs.ky.gov/KYDiabetesResources
- The quarterly newsletter, *Kentucky Diabetes Connection*, published with partners, continues after 10 years

Office of Health Equity

The DPH also houses the Office of Health Equity (OHE), which supports prevention and education efforts in reducing diabetes mortality and morbidity that exist among Kentuckians and specific populations at greatest risk. OHE also works to ensure that state diabetes prevalence data is captured, analyzed, and disseminated to minority and vulnerable communities, and it educates communities on the risk factors of disease, prevention efforts, and disease management programs. In addition, OHE acts as a resource to KDPCP in addressing barriers, inequities, and other identified social determinants of health that impact hard to reach and vulnerable populations. OHE will continue to collaborate and support KDPCP's education and prevention efforts in or to reduce the burden of diabetes across the commonwealth.

Funding

OHE does not receive funding from the Kentucky General Assembly for specific programs or activities aimed at reaching those with diabetes or prediabetes.

Reach/Benefit/Effectiveness

OHE is located within the Commissioner's Office of the DPH, which provides an opportunity to collaborate directly with diabetes prevention programs and disseminate information to a wide range of community stakeholders and partners. Continued efforts between OHE and the KDPCP will increase awareness of the burden of diabetes among vulnerable populations in the Commonwealth.

Office of Health Policy

The Office of Health Policy (OHP) is responsible for analyzing statewide administrative claims data specific to inpatient and outpatient hospitals and ambulatory care facilities. Through data

collection and analysis, OHP identifies opportunities for preparing and distributing relevant information to the public and governmental entities about health, health care, and public policy. OHP collects administrative claims data through the Kentucky Hospital Association (KHA) in the form of billing records from hospitals and ambulatory facilities. This data includes elements such as procedure codes, diagnosis codes, facility charges, and patient demographic information. Furthermore, claims data are related to inpatient hospital discharges, emergency department utilization (including observation stays), outpatient surgery, mammograms, and other outpatient procedures such as MRI, CAT scan, or procedures identified by specific CPT© codes.

OHP makes the data available on the Cabinet's web site and includes information on charges for health-care services, as well as descriptive information relevant to quality and outcome measures. The web site may be found at: http://www.chfs.ky.gov/ohp/healthdata/. The quality indicator reports presented on the web site are created using quality indicator software called MONAHRQ which was developed by the Agency for Health Care Research and Quality and the Department for Health and Human Services. The quality indicators provide a measure specific to medical conditions and surgical procedures performed in a hospital setting in addition to hospital utilization, maps of avoidable hospital stays, and county rates of hospital use. This data is a valuable source of information for the public and governmental entities.

OHP also prepares analyses of the data in response to approximately 50 requests per year from other entities. In summary, while OHP does not operate any programs, it is a provider of data, reports, and analyses to other entities such as DPH and policymakers.

Funding

OHP does not receive funding from the Kentucky General Assembly for specific programs or activities aimed at reaching those with diabetes. Included within the annual operating budget is $200,000 allocated for the collection of administrative claims data through the KHA.

Reach/Benefit/Effectiveness

Since the KHA has long-standing, established relationships with the reporting entities, OHP contracts directly with KHA to streamline data collection without duplicating efforts or compromising the quality of the data. Utilizing MONAHRQ to create an interactive web site provides information about quality of care, and health care utilization at the hospital level, as well as preventable hospitalizations, and rate of conditions and procedures at the county level.

Although the data is sufficient to inform decision-making and surveillance, there is an opportunity to have more robust data by employing a mechanism for a unique identifier for each person served by inpatient, outpatient, and/or ambulatory facilities. For example, currently there is no way to discern if two admissions related to uncontrolled diabetes on an annual report, represents

two individuals or the same person. Other states have implemented processes that do not involve the use of Personal Health Information (PHI) identifiers to address this issue, ensuring the data remains confidential and "de-identified." The use of a unique identifier is currently being explored by OHP.

Coordinated Efforts

In addition to the activities that the DPH, DMS, OHP, and KEHP perform individually to address diabetes, these organizations also collaborate on, and/or provide support for, diabetes-related activities. The recommendations, included later in this report, indicate which agency plays a lead role in carrying out that activity. All are complimentary to one another and center around access to the DPP, DSME, and improving clinical care delivered to those with diabetes. Examples are described below.

Diabetes Prevention Program (DPP)

As detailed in the previous section, both KEHP and DPH have been very involved with promoting the DPP effort in Kentucky. Personnel Cabinet/KEHP staff as well as third-party administrator staff serve on the prediabetes/DPP steering committee. Kentucky's success in promoting the DPP has been highlighted in numerous state and national documents and presentations. In particular, Kentucky's work was included in two CDC Emerging Practices Documents – one dealing with coverage of DPP for state employees, through KEHP, and one dealing with referrals. These documents can be found at: www.chfs.ky.gov/diabetes.

Data from the Office of Health Policy (OHP)

The data collected and compiled by the OHP is utilized extensively by DPH and many organizations to produce burden/impact reports, fact sheets, presentations, grant applications, and more. In 2015, OHP entered into a Memorandum of Agreement with DPH to allow direct access to the data by epidemiologists who have experience in analytics; however, OHP continues to provide analyses and lend support to those who may or may not have access to the data. OHP remains responsive to any request for data once necessary data use agreements are fully executed.

MCO's Utilizing KDPCP Materials

KDPCP produces and updates diabetes-related educational materials. A number of organizations outside of DPH request and utilize these materials in their education and disease management programs. MCOs, including Passport Health P lan and CoventryCares, have been utilizing "Diabetes Basics" and/or "Nutrition Basics" with their members.

DMS and Local Health Departments (LHD)

Medicaid and DPH are both in the Cabinet for Health and Family Services and have collaborated closely over many years. All Medicaid MCOs have contracts with the LHDs for a variety of preventive services providing care to Kentuckians in their local communities. Outside of their Preventive Fee Schedule, LHDs offer other programs that can improve the health of the community such as WIC (Women, Infants and Children Supplemental Nutrition Program), EPSDT (Early Periodic Screening, Diagnosis and Treatment Program), family planning, prenatal care, and Tuberculosis (TB) treatment that are covered by Medicaid or federal funding.

KEHP and the Department for Public Health (DPH) - Wellness

The Personnel Cabinet, KEHP, and DPH have partnered in pursuit of promoting and improving access to wellness programs. The Personnel Cabinet and DPH continue to explore embedding DPH Diabetes Education and KEHP Disease Management. This would provide both local and face-to-face Diabetes Education and Management to KEHP members in hopes of enhancing the Diabetes Disease Management services already provided. Wellness points are provided for KEHP members participating in the DPP, while points for participation in DSME are currently being considered.

KEHP members who chose a LivingWell health plan option are required to take the HumanaVitality health assessment or complete a biometric screening. The partnership between KEHP and DPH has expanded access for KEHP members to receive the biometric screening as LHDs are providing many of these screening events around the state including onsite in DPH and other state government buildings.

Community Health Worker Certification

DPH has convened a Community Health Worker (CHW) Advisory Workgroup since 2014. The CHW Advisory Workgroup has explored the benefits and feasibility of CHW certification and is moving forward with establishing the process which will be managed in DPH. Kentucky is fortunate to have several existing CHW programs in the state, including Kentucky Homeplace in the University of Kentucky Center of Excellence in Rural Health, as well as in LHDs, faith based organizations, and hospital organizations. These existing programs provide experience based information and have shared outcomes reports. The CHW Advisory Workgroup has also received technical assistance from the Association of State and Territorial Health Officials (ASTHO) and other states that are in the process of developing or have developed CHW training, certification, and reimbursement models. The CHW Advisory Workgroup will use those best-practices and methods to develop the standards, guidance, and regulations for a Kentucky process of certification and potential reimbursement by payers. The CHW Advisory Workgroup meets monthly and includes representatives from the Office of Health Policy, Department for Medicaid Services, Kentucky Department for Public Health, local health departments, hospital

organizations, universities, faith-based organizations, Kentucky Board of Nursing, local health departments, Federally Qualified Health Centers, Kentucky Primary Care Association, and the Foundation for a Healthy Kentucky. Additionally, an independent Kentucky Association of Community Health Workers (KYACHW) was formed as a 501c3 in 2016, which has strengthened the networking of CHWs in the state.

Section 3 – Moving Kentucky Forward

Healthcare Effectiveness Data and Information Set (HEDIS) and Hospital Discharge Prevention Quality Indicators (PQI's)

The legislation that guides the content of this report requires the Department for Medicaid Services, Department for Public Health, Office of Health Policy, and Kentucky Employees' Health Plan to develop joint benchmarks on diabetes. This is a challenge as each entity serves different groups of consumers and has very different types of data available. However, to meet this call for common benchmarking, the group has chosen related measures which, when tracked over time, can demonstrate Kentucky's progress in responding to the diabetes epidemic.

HEDIS and HEDIS-Like Measures

As discussed previously in this report, there is widespread agreement among health care and public health professionals as to how diabetes should be addressed to improve outcomes for those with diabetes. There are clear standards of care which must be addressed, and many of these standards are benchmarked and measured via the Healthcare Effectiveness Data and Information Set (HEDIS). HEDIS is a tool used by more than 90 percent of America's health plans to measure performance on important dimensions of care and service. National benchmarks for these measures have been established for Medicaid, Medicare, and private insurers. The diabetes specific HEDIS measures are as follows:

The percentage of adults 18-75 years of age with diabetes (type 1 or 2) who had each of the following:

- A1C testing;
- A1C poor control (>9.0%);
- A1C control (<8.0%);
- A1C control (<7.0%) for a selected population;
- LDL-C screening*;
- LDL-C control (<100 mg/dl)*;
- Medical attention for nephropathy;
- BP control (<140/80 mm Hg)*; and
- BP Control (<140/90 mm Hg)l;

*these measures are subject to exclusion from the 2015 HEDIS standards now under review.

Diabetes is one of six conditions which DMS requires MCOs to target for improvement as part of the External Quality Review (EQR) process. Diabetes specific HEDIS measures are reported for each MCO. Similarly, the KEHP makes use of what are termed "HEDIS-Like" measures in which data is reported in a manner very similar to the HEDIS standards. The

DPH conducts the Kentucky Behavioral Risk Factor Surveillance Survey (KyBRFSS) which includes data on diabetes standards of care. Only one of these, the A1C measure, is similar to a HEDIS measure; however, the other measures reported are key standards of care that are important to track as measures of diabetes management, and these measures will be used as benchmarks for DPH in monitoring overall population health.

Medicaid – HEDIS Measures

Table 27 contains HEDIS data on adults in Kentucky Medicaid managed care plans. On items marked with (+), Kentucky compares favorably with the national average score for all Medicaid managed care programs nationwide. The items marked with a (-) are items where Kentucky Medicaid managed care members lag behind the nation, the most notable of these being a lack of eye exams. Please note that this data includes only those enrolled in a Medicaid Managed Care program.

	Table 27: Kentucky Medicaid Managed Care HEDIS Scores 2015 **(adults aged 18-75 enrolled in a Kentucky Medicaid Managed Care Plan)**					
	Coventry (+)=compares favorably (-) compares unfavorably	**Humana** (+)=compares favorably (-) compares unfavorably	**Passport** (+)=compares favorably (-) compares unfavorably	**WellCare** (+)=compares favorably (-) compares unfavorably	**Anthem** (+)=compares favorably (-) compares unfavorably	**2015 HEDIS National Benchmark** **(50th percentile)**
A1C Testing	87.0% (+)	88.9% (+)	90.8% (+)	88.8% (+)	90.9% (+)	86.2%
A1C Poor control (>9.0%)	39.8% (+)	67.0% (-)	38.4% (+)	40.6% (+)	51.1% (-)	42.2% (lower is better)
Eye Exam (Retinal) Performed	40.5% (-)	40.0% (-)	40.7% (-)	43.7% (-)	34.7% (-)	54.7%
Medical Attention to Nephropathy	80.8% (+)	84.5% (+)	81.7% (+)	82.7% (+)	84.1% (+)	81.8%

Joint Benchmarks

The Kentucky Employees' Health Plan reviews data that are very similar to the HEDIS measures but which may deviate from the normal HEDIS parameters. Such measures are called "HEDIS-Like" and are commonly used when data does not conform to the full set of guidelines. Truven Health Analytics provides analysis for the selected diabetes data for KEHP. Table 28 shows HEDIS-Like rates for early retirees and active members who have been diagnosed with diabetes. For all five measures reported by Truven, KEHP members have lower (poorer) rates than the National Benchmark.

The data in this report is quite different than the previous report, and it could be due to members migrating to Consumer Driven Health Plans which drove the utilization down somewhat and the movement in 2015 to all new vendors.

Table 28: KEHP Diabetes HEDIS-Like Measures 2015		
Measure	**KEHP Rate (+) compares favorably (-) compares unfavorably**	**2015 HEDIS National Benchmark**
Pediatric A1C Test (age 5-17)	90% (-)	92%
A1C Test Age 18-75	78% (-)	89%
Dilated Eye Exam (age 18-75)	30% (-)	35%
Lipid Panel (age 18-75)	72% (-)	83%
Microalbumin / Nephropathy test (age 18-75)	79%(-)	89%

Department for Public Health HEDIS-Like Measures

The Department for Public Health conducts the Kentucky Behavioral Risk Factor Surveillance Survey (KyBRFSS) which tracks specific health measures for Kentucky adults. Table 29 includes data on diabetes standards of care from the KyBRFSS. Only the items related to A1C are similar to a HEDIS measure; however, the other measures reported are key standards of care that are critical as measures of diabetes management. A full 90% of Kentucky adults with diabetes report they have had at least one A1C test in the previous 12 months. Seventy-four percent report that they have had two or more A1C tests in the previous 12 months, as is considered standard for a person with diabetes.

Table 29: Diabetes Standards of Care for Kentucky Adults KY BRFSS- 2015	
One or more A1C past 12 months	90.4%
Two or more A1C past 12 months	74.1%
Foot exam from HCP in past 12 months	72.4%
Dilated Eye Exam past 12 months	67.3%

Office of Health Policy - Prevention Quality Indicators (PQI's)

The OHP maintains a nationally benchmarked set of indicators based on hospital discharge data, "Prevention Quality Indicators (PQIs)." The PQIs are measures instituted by the Agency for Healthcare Research and Quality (AHRQ) and are described as follows:

> *A set of measures that can be used with hospital inpatient discharge data to identify the quality of care for "ambulatory care sensitive conditions." These are conditions for which good outpatient cares can potentially prevent the need for hospitalization or for which early intervention can prevent complications or more severe disease. Even though these indicators are based on hospital inpatient data, they provide insight into the community health care system or services outside the hospital setting. For example, patients with diabetes may be hospitalized for diabetic complications if their conditions are not adequately monitored or if they do not receive the patient education needed for appropriate self-management. With high-quality, community-based primary care, hospitalization for these illnesses often can be avoided. Although other factors outside the direct control of the health care system, such as poor environmental conditions or lack of patient adherence to treatment recommendations, can result in hospitalization, the PQIs provide a good starting point for assessing quality of health services in the community.*

These measures provide a population-wide picture of diabetes complications and management for the entire Commonwealth. In addition to the advantage of national benchmarking provided by use of the PQI measures, the data is available at the county level with comparisons to the national benchmark, which allows more precise identification of geographic areas where the need for intervention may be high. It should also be noted that these two sets of measures, HEDIS and PQIs, are directly related to each other. Improvements in HEDIS measures should produce improvements in the PQI measures as people with diabetes experience greater control of blood sugar, cholesterol, and blood pressure (measured by HEDIS) and, as a result, incur fewer hospitalizations for the complications of diabetes (measured by the PQIs).

The four diabetes specific PQI measures are:

Diabetes Short Term Complications Admission Rate = Admissions for a principal diagnosis of diabetes with short-term complications (ketoacidosis, hyperosmolarity, or coma) per 100,000 population, ages 18 years and older. This excludes obstetric admissions and transfers from other institutions.

Diabetes Long Term Complications Admission Rate = Admissions for a principal diagnosis of diabetes with long-term complications (renal, eye, neurological, circulatory, or complications

not otherwise specified) per 100,000 population, ages 18 years and older. It excludes obstetric admissions and transfers from other institutions.

Uncontrolled Diabetes Admission Rate = Admissions for a principal diagnosis of diabetes without mention of short-term (ketoacidosis, hyperosmolarity, or coma) or long-term (renal, eye, neurological, circulatory, or other unspecified) complications per 100,000 population, ages 18 years and older. This excludes obstetric admissions and transfers from other institutions.

Diabetes Related Lower Extremity Amputation = All discharges of age 18 years and older with ICD-9-CM procedure code for lower-extremity amputation and diagnosis code of diabetes in any field.

Table 30 shows trend data for Kentucky from 2008 to 2011 and for 2014. Kentucky's rates on three of the four measures (Short Term Complications, Long Term Complications and Lower Extremity Amputations) are significantly higher than the national average.

Table 30: Agency on Health Research Quality – Prevention Quality Indicator 2008 - 2014

PQI Indicator	2008	2009	2010	2011	2014	National Rate - 2014
PQI 1: Short Term Diabetes Complications	.69	.74	.78	.77	1.0	.81/1,000
PQI 3: Long Term Diabetes Complications	1.08	1.11	1.09	1.05	1.21	1.16/1,000
PQI 4: Uncontrolled Diabetes	.27	.24	.23	.21	.15	.14/1,000
PQI1 6: Lower Extremity Amputations	.33	.39	.35	.16	.23	.18/1,000

Note: 2012 and 2013 data is not available due to software compatibility issues. 2015 data will not be reported due to changes in medical coding from ICD9 to ICD10 codes mid-2015. This change makes data for 2015 less reliable.

Recommendations and Actions Items to Address Diabetes

The committee has identified six broad areas that address the prevention of new cases of diabetes and improvement of outcomes for Kentuckians living with diabetes. For each of these areas, specific actions to support diabetes prevention and control have been identified. These recommendations and actions are based on accepted standards of practice and scientific evidence of what works to improve prevention and control outcomes for those with diabetes and are consistent with national and state efforts such as Healthy People 2020 objectives in conjunction with existing diabetes, other chronic disease state planning efforts, and federal grant guidance from CDC. Lastly, these action items are based on the use of the best available scientific evidence, treatment goals, strategies to attain such goals, and individual changes that persons with diabetes are willing and able to make.

Please note that these recommendations are NOT listed in order of priority; rather, they are listed in the logical sequence of prevention, diagnosis, and improved clinical and self-management along with recommendations for infrastructure, policy, training, and health information technology capabilities necessary to address the diabetes epidemic.

Recommendations include:

1. **Strengthen efforts to prevent the development of new cases of diabetes;**
2. **Increase use of evidence-based screening for the diagnosis of prediabetes, diabetes and gestational diabetes and referral to appropriate service;**
3. **Strengthen efforts to improve management and control among those who have ddiabetes;**
4. **Assure a sustainable ddiabetes prevention and control public health infrastructure and workforce at the state and local level;**
5. **Support policy changes to improve outcomes for persons with prediabetes, and diabetes; and**
6. **Improve ddiabetes and chronic disease surveillance systems and Health Information Technology (HIT) systems needed to determine the extent and impact of diabetes on the Commonwealth.**

Rationale and detailed action items regarding each of these recommendations are described in the following pages.

2017 Kentucky Diabetes Report Recommendations

Recommendation #1: Strengthen efforts to prevent the development of new cases of diabetes.

Primary Focus: Increase access to, and utilization of, evidence-based lifestyle change programs – particularly CDC-Recognized Diabetes Prevention Programs (DPP).	**Lead Agency:** DPH, KEHP, DMS **Partner Agencies:** OHE	**Funding Needed:** An additional $100,000 in new funds in the DPH budget.

Rationale:

- Data from CDC shows that if current trends continue, 1 of 3 U.S. adults will have diabetes by 2050.
- Research has shown that approximately 15-30% of persons with prediabetes will develop type 2 diabetes in five years in the absence of intervention.
- The DPP has been shown to decrease the progression to diabetes in those at high risk by 58%.
- Access to DPP programs across the Commonwealth has increased significantly since 2012; however, many more programs are needed. There are currently 55 DPP organizations in Kentucky.
- Training opportunities are limited and expensive.
- KEHP is currently the only entity that provides DPP as a covered benefit. Reimbursement is necessary for program sustainability.

Action Items

A. Expand the availability of CDC Recognized DPP offerings with a special focus on populations at highest risk of diabetes health disparities, and/or least access to DPP programs.
   1) DPH will provide financial support for training of DPP Lifestyle Coaches using CDC curricula as funding will allow.
   2) DPH, KEHP, DMS, and OHE will coordinate implementation of communication and marketing strategies to raise awareness of prediabetes and its risk factors, the benefits of DPP, and the locations of DPP programs via member networks, state and local coalitions, LHDs, and partner organizations.
   3) KEHP will work to increase the DPP provider network across the Commonwealth.
   4) KEHP will continue to research and implement the best practices for delivering DPP classes and the potential for claims submission and/or a more automated processes for referral and billing.
   5) DPH will continue to provide outreach and information to employer groups and private insurers about DPP and encourage offering DPP as a covered employee benefit.
   6) DPH will work with DPP providers, to implement processes to support Medicare coverage for DPP beginning in January 2018.
   7) DPH will continue to provide support to existing DPP organizations/lifestyle coaches via quarterly conference calls, and limited technical assistance.
   8) DPH will increase awareness regarding accreditation, certification, and licensure to encourage new CDEs, LDEs, and accredited programs.

B. Increase participation in CDC-Recognized DPP programs.
    1) KEHP will continue to incentivize members who participate in DPP programs with wellness rewards.
    2) DMS will implement incentives such as “My Rewards” for Medicaid participants in DPP when the 1115 Medicaid Waiver is approved.
    3) DPH will continue to explore available online platforms for delivery of DPP, and share with payer for their consideration.
    4) OHE will work with DPH to review DPP training curricula and suggest improvements regarding cultural competency, social determinants of health and equity that can be shared with the CDC.
    5) DPH, DMS, and KEHP will work together to identify and eliminate barriers to DPP participation.

C. Implement referral mechanisms/policies related to CDC-Recognized DPP programs.
    1) KEHP will continue to identify participants at risk for diabetes and provide outreach to them regarding their eligibility and interest in the DPP program.
    2) DMS will develop/implement strategies to identify participants at risk for diabetes and provide outreach to them regarding their eligibility and interest in the DPP program.
    3) KEHP will continue to offer biometric screenings (including blood glucose) for members and improve linkages of those with elevated values to DPP services.
    4) DPH will maintain an online listing of available DPP programs and new DPP classes to facilitate provider and self-referrals.
    5) DPH and DMS will promote the toolkit from the American Medical Association and CDC to assist providers in screening for prediabetes, referral to DPP programs and associated coding/billing process.

D. Address financial sustainability of CDC-Recognized DPP programs.
    1) Engage state, county, and local government agencies to include DPP as a covered benefit for employees.
    2) KEHP will maintain DPP participation as a covered benefit for members.
    3) DMS will explore offering DPP as part of the 1115 Medicaid waiver with MCO coverage.
    4) Work with DPP providers, insurers to prepare for implementation processes to be in place for Medicare coverage for DPP beginning January 2018.
    5) DPH will provide outreach and information to employer groups and private insurers about DPP and encourage offering DPP as a covered employee benefit.
    6) DPH will continue to provide guidance to the committee working on certification for Community Health Workers regarding appropriate use of CHWs in Diabetes Self-Management Education and Support (DSME/S).

2017 Kentucky Diabetes Report Recommendations

Recommendation #2: Increase use of evidence-based screening for the diagnosis of prediabetes, diabetes and gestational diabetes and referral to appropriate services.

Primary Focus: Promote evidence-based screening guidelines.	**Lead Agency: KEHP, DMS** **Partner Agencies: DPH**	**Funding Needed:** An additional $100,000 in new funds in the DPH budget to support work with health systems to improve diabetes screening practices.

Rationale:

- Early diagnosis of diabetes, prediabetes, and gestational diabetes offers the best opportunity for avoiding complications/improving outcomes.
- CDC estimates that approximately 25% (1 in 4) of people with diabetes are undiagnosed.
- Once diagnosed, people with these conditions must be connected to appropriate programs and services to learn about the disease and how they can take charge of their health by managing their disease.

Action Items

A. DMS, KEHP and DPH will work with MCOs, KEHP Anthem administrator, health care providers, LHDs, and health plans to implement systems of clinical screening for diagnosis of prediabetes/diabetes and gestational diabetes – including standards released in 2015 by the USPSTF, which specifies when individuals should be screened and which screening tests are appropriate for use - including use of A1C as a diagnostic test.
   1) DPH, DMS, and KEHP will promote evidence-based clinical screening for prediabetes, diabetes, and gestational diabetes.
   2) DPH, DMS, and KEHP will promote identification (during the pregnancy) and education of those with gestational diabetes (GDM) for follow-up (after delivery) for referral to DPP as appropriate.
   3) KEHP will continue to provide/promote member biometric screenings (which include a blood glucose) as part of the “LivingWell Promise” to increase awareness of key diabetes indicators.
   4) DPH will work with partners to promote the AMA and CDC’s “Prevent Diabetes STAT” toolkit to providers across the Commonwealth.
   5) DPH will work with the Regional Extension Center and other partners to promote utilization of clinical decision support functions in primary care providers’ electronic health records (EHR) to assist providers in consistently implementing evidence-based guidelines for screening and diagnosis.

2017 Kentucky Diabetes Report Recommendations

Recommendation #3: Strengthen efforts to improve management and control among those who have diabetes.

Primary Focus: Increase the availability and utilization of evidence-based Diabetes Self-Management Education (DSME) programs and coordinate with case/disease management services.	**Lead Agency:** DPH, DMS, KEHP **Partner Agencies:** DSME providers	**Funding Needed:** An additional $250,000 in new DPH funds are requested to expand DSME services including DSME training expenses, documentation of DSME services statewide, data collection for DSME program accreditation, and the provision of technical assistance.

Rationale:

- DSME is a collaborative process in which diabetes educators help people with, or at risk for, diabetes gain the knowledge and problem-solving and coping skills needed to successfully self-manage the disease and its related conditions.
- DSME – within an accredited program, has been proven to improve outcomes in those with diabetes including: decreased hospital admissions and readmissions, improved diabetes control (1% reduction in A1C), reduced onset and advancement of diabetes complications, and improved quality of life.
- DSME has been shown to be cost effective, reducing estimated lifetime health care costs.
- DSME is an underutilized service – only about half of those with diabetes report having ever had any formal diabetes self-management education. Medicare reports that only 7% of beneficiaries have received DSME in the first year of diagnosis.
- Currently, only 66 counties have access to an accredited DSME program.

Action Items

A. Expand the availability of ADA Recognized or AADE Accredited DSME programs with a special focus on populations at highest risk of health disparities, and/or least access to DSME programs.
   1) DPH will provide/facilitate training for LHD DSME providers (and others outside of LHDs if funds allow) to provide DSME services to their communities.
   2) DPH will provide an annually updated DSME curriculum to LHDs (and to others if funds allow).
   3) DPH will maintain and expand their accredited DSME program, “Healthy Living with Diabetes.”
   4) DPH will provide support to existing Certified Diabetes Educators (CDEs) and Licensed Diabetes Educators (LDEs) via continuing education offerings, and targeted technical assistance focusing on communities/populations with a high prevalence of diabetes and prediabetes and/or those without such providers.
   5) DPH will increase awareness regarding accreditation, certification, and licensure to encourage new CDEs, LDEs, and accredited programs.

B. Increase participation in Accredited/Recognized DSME programs:
    1) KEHP will investigate incentivizing members who participate in a DSME program with wellness rewards.
    2) KEHP will coordinate with the wellness vendor and the medical third-party administrator to ensure personal health consultants advise members about DSME.
    3) DMS will consider implementing incentives in the "My Rewards" Account for Medicaid participants in DSME if the 1115 Waiver is approved.
    4) DPH will continue to explore available online platforms for delivery of DSME.
    5) OHE will work with DPH to review/update DSME training and curricula regarding cultural competency, social determinants of health, and equity.
    6) DPH, DMS, and KEHP will work together to identify and eliminate barriers to DSME participation.

C. Implement referral mechanisms/policies related to DSME:
    1) KEHP and DMS will identify participants with diabetes.
    2) DMS will continue to offer diabetes case/disease management services through the MCOs and improve DSME referrals.
    3) KEHP will continue to offer diabetes case/disease management services and improve referrals to DSME.
    4) KEHP will continue to provide/promote member biometric screenings (which include a blood glucose) as part of the "LivingWell Promise" and improve connection to DSME services for those with elevated values.
    5) DPH will maintain a listing of available DSME programs online to facilitate provider and self-referrals.
    6) DPH will work with DSME providers to improve bi-directional communication with referrals from primary care practices.

D. Address financial sustainability of DSME programs:
    1) DMS will define and operationalize the reimbursement mechanism for DSME through each of the MCOs.
    2) DPH will continue to provide guidance to the committee working on certification for Community Health Workers regarding appropriate use of CHWs in Diabetes Self-Management Education and Support (DSME/S).

E. Other Interventions:
    1) DMS will continue to offer case/disease management services via the MCOs.
    2) KEHP will continue to offer case/disease management services.
    3) KEHP will continue to offer innovative Value-Based Benefits to encourage medication adherence (members pay reduced co-pay and co-insurance and no deductible for most maintenance diabetes prescriptions/supplies).

2017 Kentucky Diabetes Report Recommendations

Recommendation #4 - Assure a sustainable diabetes prevention and control public health infrastructure and workforce at the state and local level.

Primary Focus: Ensure the delivery of diabetes-related essential public health services, particularly the development of a culturally and linguistically competent state level public health workforce in coordination of planning, training, education and marketing efforts to expand availability of DSME and DPP.	**Lead Agency:** DPH **Partner Agencies:** LHDs, coalitions	**Funding Needed:** Maintain existing state general funds of $2.4 million dollars in the biennial budget and provide an additional $500,000 new funds to DPH to support program expansion.

Rationale: Population-based public health services for all Kentuckians with or at risk for diabetes is a necessity in our high burden/low resource state. Providing these state supported opportunities for Kentuckians is vital to improve outcomes.

Action Items

A. DPH will administer and implement the CDC Cooperative Agreement with other related chronic disease programs.

B. DPH will ensure the delivery of population-based diabetes services - consistent with the Essential Public Health Services (EPHS) including:
    1) Monitor health status to identify [diabetes-related] community health problems
        a) Analyze diabetes-related data from a variety of sources
        b) Disseminate data via fact sheets, documents, presentations, and publications
    2) Inform, educate, and empower people about health issues [diabetes]
        a) Provide public awareness/education regarding diabetes prevention and control to the public via multiple venues, tools, materials, etc.
        b) Provide/facilitate/promote evidence-based behavior change education
            i. Diabetes Self-Management Education (DSME)
                a. Provide training for providers
                b. Provide/facilitate continuing education opportunities
                c. Provide up-to-date curricula
                d. Develop/provide/educational materials
                e. Maintain the Diabetes Resources Directory – an online resource listing DPP organizations and classes statewide
                f. Maintain a nationally accredited DSME program (Healthy Living with Diabetes) at the state level (which now includes 20 LHDs)
            ii. Diabetes Prevention Program (DPP)
                a. Facilitate training for lifestyle coaches

b. Develop tools and materials
c. Provide leadership for the statewide DPP steering committee.

3) Mobilize community partnerships to identify and solve health problems
   a) Provide guidance and support for community coalitions with a focus on diabetes prevention and control (currently 45 coalitions). Current guidance emphasizes the improved access and participation in DSME and DPP programs.
   b) Facilitate/participate in the state coalition – Kentucky Diabetes Network (KDN)
      i. Facilitate workgroups on diabetes prevention, diabetes education, partnerships, and community outreach
      ii. Continue to facilitate the DPP Steering Committee
   c) Participate in other coalition/partnerships with agencies, associations, and organizations interested in diabetes prevention, control, and quality improvement, (Regional extension centers, the Heart Disease and Stroke Prevention Task Force, employer groups, etc.)
4) Develop policies and plans that support individual and community health efforts
5) Link people to needed personal health services (e.g., maintain the Diabetes Resource Directory)
6) Assure a competent public health care workforce
   a) Facilitate/Provide continuing education opportunities
   b) Provide ongoing strategic communication and tools – newsletter, calls, materials, and tools.

C. DPH will provide leadership and coordination to expand the Diabetes Self-Management Education (DSME), and the Diabetes Prevention Program (DPP), including education for health care professionals.

D. Work with diabetes stakeholders as well as other interested stakeholders (e.g., the CHW Advisory Committee) to define roles for health professionals, allied health professionals, community health workers, and others in promoting diabetes education/management.

2017 Kentucky Diabetes Report Recommendations

Recommendation #5 - Support policy changes to improve outcomes for persons with prediabetes, and diabetes.

Primary Focus: Support policies to ensure coverage and adequate reimbursement for DSME and DPP services under public and private insurance plans – particularly the 1115 Medicaid 1115 Waiver Kentucky HEALTH1	**Lead Agency:** DMS, DPH **Partner Agencies:** MCO's, OHP, OHE, CHW workgroup	**Funding Needed:** Staff time will be required but unable to estimate at this time.

Rationale:

- Despite the strong evidence-base around the DPP, it is not currently covered/reimbursed by Medicaid or private insurance. (Medicare will cover in 2018).
- DSME is covered by public and private insurance but is underutilized, partly due to being not well defined/known and billing is complex.
- Reimbursement is necessary for the sustainability of DPP and DSME programs.

Action Items

A. Support policies to make DPP a covered benefit for Medicaid beneficiaries in Kentucky.
   1) DMS, DPH, OHP, and KEHP will support implementation of the Medicaid 1115 Waiver related prevention and control of diabetes and other chronic diseases
   2) DPH and DMS will work together to draft requirements/guidelines/reimbursement criteria for DPP
   3) DMS will consider adding "My Rewards" Account incentives for DPP and DSME participation if the 1115 Medicaid Waiver is approved.

B. Support policies to make DPP a covered benefit under private insurance and employers by sharing information about the evidence-base and business case for DPP.

C. Work with DMS and the MCOs to define reimbursement specifics for each MCO related to DSME and DPP.

D. Support policies that remove or don't include co-pays or co-insurance for DSME and DPP services.

E. Support policies to provide reimbursement for Certified Diabetes Educators (CDE) and Licensed Diabetes Educators (LDE) working within an Accredited or Recognized DSME program in Kentucky.

F. Continue to work toward certification and reimbursement for Community Health Workers (CHWs)

G. Support policies that require insurance plan coverage of A1C as a screening/diagnostic test for diabetes/prediabetes.

H. KEHP will continue to work with the medical third-party administrator and the pharmacy benefits manager to increase awareness of new diabetes efforts that may improve outcomes for members with diabetes and prediabetes.
I. KEHP will investigate the potential of offering online DPP courses to increase member participation.

2017 Kentucky Diabetes Report Recommendations

Recommendation #6 - Improve diabetes and chronic disease surveillance systems and Health Information Technology (HIT) systems needed to determine the extent and impact of diabetes on the Commonwealth.

Primary Focus: Include a "unique patient identifier" on hospital and emergency department administrative claims records to improve understanding of hospital and ER visit patterns, particularly repeat hospitalization for individuals; provide funding to support expansion of the sampling frame for the Behavioral Risk Factor Survey conducted by DPH and CDC.	**Lead Agency: OHP, DPH** **Partner Agencies:**	**Funding Needed:** An additional $200,000 in new state general funds are requested to support expansion of the Kentucky BRFSS sample to ensure adequate data for tracking health disparities and $50,000 for OHP to contract with KHA for addition of a unique patient identifier to their dataset.

Rationale:

- The ongoing, systematic monitoring and improvement of data collection on diabetes and other chronic diseases is vital for public health planning. Administrative claims data on hospitalizations and emergency department visits lacks a unique patient identifier to allow identification of inpatient readmissions and repeated ED usage.
- Administrative claims data is also limited to only the data elements on a billing claim and to only discharges and encounters of a certain type which causes an incomplete picture of true cost for services.

Action Items

A. Establish policies to improve the quality of administrative claims data to:
   1. Include a unique identifier on each hospitalization to allow data analysis to determine if patients have multiple hospitalizations for the same disease or condition;
   2. Require inclusion of additional data elements such as lab results, medications and tobacco use status to provide more information on the severity of the patient condition; and
   3. Expand the cases collected as part of the administrative claims data to include all visits to hospitals and ambulatory care centers. This addition would include laboratory and other previously uncollected data that could be used to better analyze the financial and quality of care impact of diabetes.

B. Continue work in CHFS to develop an All Payer Claims Data Base (APCD) in a Kentucky Data Trust: A statewide repository of health insurance claims information (charges and payments) from all health care payers, including health insurers, government programs, and self-insured employer plans. This information would allow Kentucky to better identify cost saving approaches to health care and support quality improvement efforts.
C. Provide state funding for the KyBRFS to support a sample size adequate to provide data at the Area Development District or county level by race and ethnicity. This will improve data on health conditions, including diabetes, and greatly improve understanding of health disparities.
D. Encourage partners to stratify data by demographics that give a comprehensive view of the burden of diabetes among vulnerable populations in the Commonwealth.
E. OHP, Medicaid, and KEHP will collect and report HEDIS and HEDIS-Like data. This data forms the basis for the joint benchmarking required as part of this report.
F. Work with UK Regional Extension Centers and other partners to encourage primary care providers to select the diabetes and hypertension Clinical Quality Measures (CQM) for their quality improvement efforts required for achieving patient centered medical home status and preparing for MACRA (Medicare Access and CHIP Reauthorization Act of 2015) and the Quality Payment Program.
G. DPH will complete and distribute the diabetes and hypertension Change Package

Attachments

Attachment 1 – Legislation - KRS 211.751-753

211.751 Goals, benchmarks, and plans to reduce incidence of diabetes, improve care, and control complications.

The Department for Medicaid Services, the Department for Public Health, the Office of Health Policy, and the Personnel Cabinet shall collaborate to identify goals and benchmarks while also developing individual entity plans to reduce the incidence of diabetes in Kentucky, improve diabetes care, and control complications associated with diabetes.

Effective: June 8, 2011

History: Created 2011 Ky. Acts ch. 83, sec. 1, effective June 8, 2011.

211.752 Annual reports to Legislative Research Commission.

The Department for Medicaid Services, the Department for Public Health, the Office of Health Policy, and the Personnel Cabinet shall submit a report to the Legislative Research Commission by January 10 of each odd-numbered year on the following:

(1) The financial impact and reach diabetes of all types is having on the entity, the Commonwealth, and localities. Items included in this assessment shall include the number of lives with diabetes impacted or covered by the entity, the number of lives with diabetes and family members impacted by prevention and diabetes control programs implemented by the entity, the financial toll or impact diabetes and its complications places on the program, and the financial toll or impact diabetes and its complications places on the program in comparison to other chronic diseases and conditions;

(2) An assessment of the benefits of implemented programs and activities aimed at controlling diabetes and preventing the disease. This assessment shall also document the amount and source for any funding directed to the agency or entity from the Kentucky General Assembly for programs and activities aimed at reaching those with diabetes;

(3) A description of the level of coordination existing between the entities on activities, programmatic activities, and messaging on managing, treating, or preventing all forms of diabetes and its complications;

(4) The development or revision of detailed action plans for battling diabetes with a range of actionable items for consideration by the General Assembly. The plans shall identify proposed action steps to reduce the impact of diabetes, prediabetes, and related diabetes complications. The plan shall also identify expected outcomes of the action steps proposed in the following biennium while also establishing benchmarks for controlling and preventing relevant forms of diabetes; and

(5) The development of a detailed budget blueprint identifying needs, costs, and resources required to implement the plan identified in subsection (4) of this section. This blueprint shall include a budget range for all options presented in the plan identified in subsection (4) of this section for consideration by the General Assembly.

Effective: June 8, 2011

History: Created 2011 Ky. Acts ch. 83, sec. 2, effective June 8, 2011.

211.753 Use of agencies' existing diabetes information, data, initiatives, and programs to implement KRS 211.751 and 211.752.

The requirements of KRS 211.751 and 211.752 shall be limited to the diabetes information, data, initiatives, and programs within each agency prior to June 8, 2011, unless there is unobligated funding for diabetes in each agency that may be used for new research, data collection, reporting, or other requirements of KRS 211.751 and 211.752.

Effective: June 8, 2011

History: Created 2011 Ky. Acts ch. 83, sec. 3, effective June 8, 2011.

Attachment 2 – Committee Members

The following people participated in the preparation of the 2017 Diabetes Report.

Cabinet for Health and Family Services

Department for Public Health

Hiram C. Polk, Jr., MD, Commissioner
Connie Gayle White, MD, MS, FACOG, Senior Deputy Commissioner
Gary L. Kupchinsky, MA, Director, Division of Prevention and Quality Improvement
Sue Thomas-Cox, RN, Manager, Chronic Disease Prevention Branch
Theresa A. Renn, RN, CDE, Program Manager, Kentucky Diabetes Prevention and Control Program
Teresa A. Wood, PhD, Epidemiologist, Chronic Disease Prevention Branch
Sarojini Kanotra, PhD, MPH, Epidemiologist, Kentucky Behavioral Risk Factor Surveillance Survey
Ariel Arthur, BA, Health Policy Analyst, Chronic Disease Prevention Branch
Vivian Lasley-Bibbs, MPH, Epidemiologist, Office of Health Equity

Office of Health Policy

Carla Crane, PhD, Executive Advisor
Allison Lile, Health Care Data Administrator

Department for Medicaid Services

Stephanie Bates, Branch Manager, Division of Program Quality and Outcomes
Kurt Godshall, Healthcare Data Administrator
Leslie Yagel, Nurse Consultant Inspector, Division of Program Quality and Outcomes

Personnel Cabinet

Department of Employee Insurance, Kentucky Employees' Health Plan

Jenny Goins, Commissioner
Donna Marcum, Staff Assistant, Office of the Commissioner
Bruce Cottew, Healthcare Data Administrator, Division of Financial and Data Services

Attachment 3 – Stakeholder Feedback Summary

It was determined that feedback from external stakeholders was needed to enhance the 2017 Diabetes Report and ensure that it was a useful document for all interested parties (i.e., local health departments, diabetes advocates, health plans, industry, etc.). To this end, a feedback session was held on April 22, 2016. The session was facilitated by Dr. Julie McKee, DMD, and was attended by 32 participants from across the state. Overall, the feedback from the group was very positive.

A brief summary of some of the key themes is included below.

When asked what parts of the Report/Recommendations were most useful, the group unanimously indicated that they found the data section the most useful. Specifically, the prevalence data, cost information, and quality measures were mentioned. The group reported that they had used this information in grant applications, presentations, press releases, with policy makers, and with other states to influence them to develop their own report.

Gaps in the Report/Recommendations were also discussed. The participants requested more breakdown of the data including, age, type of diabetes, and race. More information on disparities was also requested.

There were also comments that information on "how to use the report" or a summary with specific points that could/should be made would be helpful.

On making the document more user-friendly, the group suggested a variety of ideas including, a citation so that credit could be given when the report was used, quick links that would allow navigating through the large document; more infographics, recommendations listed earlier in the report; vetting of the report with stakeholders, and more hard copies printed.

The committee utilized this feedback in the development of the 2017 report and greatly appreciates this input.

Attachment 4 – Diabetes Overview

What is Diabetes?

Diabetes is a common chronic disease in which the amount of sugar (glucose) in a person's blood is too high. Either the body does not produce insulin or is not able to make use of the insulin it produces. Insulin is a hormone that is needed to convert sugar, starches and other food into energy needed by every cell in the body for daily life. When the amount of sugar circulating in the blood is too high, it causes damage to many parts of the body including the eyes, heart, blood vessels, kidneys and nerves. This damage makes diabetes the leading cause of adult blindness, end-stage kidney disease and amputations of the foot and/or leg. People with diabetes are also at greatly increased risk for heart disease and stroke. In addition, diabetes can cause serious complications during pregnancy resulting in more preterm births, more cesarean sections (C-section) due to larger babies, life-threatening conditions such as preeclampsia, birth defects and increased risk of type 2 diabetes for both the mother and the child once she/he reaches adulthood.

What is Prediabetes?

Prediabetes is a condition in which an individual's blood glucose or A1C levels (a blood test that provides an average of the patient's blood glucose levels over the last 12 weeks) are higher than normal, but not high enough to be classified as diabetes. People with prediabetes are at increased risk for developing type 2 diabetes, heart disease and stroke. Evidence has shown that people with prediabetes that lose weight and increase their physical activity can prevent or delay the development of type 2 diabetes and may even return blood sugar levels to normal.

How are Diabetes and Prediabetes Diagnosed?

Appropriate blood testing for diabetes among those at risk for the disease is vital to ensure that patients with elevated blood sugar levels or high A1C are identified as early as possible. Early diagnosis and appropriate treatment/management provides the best opportunity to prevent diabetes and its complications. Testing involves a simple blood test performed in a health care facility.

Types of Diabetes

The major types of diabetes are:

- **Type 1** Diabetes (previously known as "Juvenile Diabetes") develops when the body does not produce insulin, which controls blood sugar (glucose) levels. To survive, people with type 1 diabetes must have insulin delivered by injections or an insulin pump. This form of diabetes usually strikes children and young adults, although disease onset can occur at any age. In adults, type 1 diabetes accounts of approximately 5% of all diagnosed cases of diabetes. **There is no known way to prevent type 1 diabetes.**

- **Type 2** Diabetes usually begins as insulin resistance, a disorder in which the cells do not use insulin properly. As the need for insulin rises, the pancreas gradually loses its ability to produce it. In adults, type 2 diabetes accounts for about 90-95% of all diagnosed cases of diabetes. Risk factors for type 2 diabetes include: older age, obesity, family history of diabetes, personal history of gestational diabetes, impaired glucose metabolism, physical inactivity and race/ethnicity. African Americans, Hispanic/Latino Americans, American Indians, some Asian Americans and Native Hawaiians or other Pacific Islanders are at particularly high risk for development of type 2 diabetes and its complications. Type 2 diabetes in children and adolescents, although still rare, is being diagnosed more frequently among African Americans, Hispanic/Latino Americans, American Indians and Asian/Pacific Islanders. Type 2 diabetes may be preventable through modest lifestyle changes.

- **Gestational Diabetes** is a form of glucose intolerance diagnosed during pregnancy. It occurs more frequently among African Americans, Hispanic/Latino Americans, and American Indians. It is also more common among obese women and women with family history of diabetes or gestational diabetes. During pregnancy, gestational diabetes requires treatment to optimize maternal blood glucose levels to lessen the risk of complications in the infant and mother. Women who have had gestational diabetes have a 35% - 60% chance of developing diabetes in the next 10-20 years.

How is Diabetes Managed?

Diabetes can affect many parts of the body and can lead to serious complications such as blindness, kidney damage, and lower-limb amputations. Working together, people with diabetes, their support network and their health care providers can reduce the occurrence of these and other diabetes complications by controlling the levels of blood glucose, blood pressure and blood lipids, and by receiving other preventive care practices in a timely manner.

Managing diabetes is a complicated endeavor. diabetes is managed by a combination of appropriate clinical care from a health care provider who understands diabetes care, combined with individual responsibility of the person with diabetes for taking medications as directed, making changes to their food choices and developing a regular pattern of physical activity in order to control blood sugar.

Prevention of Type 2 Diabetes

The Diabetes Prevention Program (DPP), a large prevention study of people at high risk for developing diabetes, demonstrated that a large prevention study of people at high risk for developing Diabetes, demonstrated that lifestyle intervention to lose weight and increase physical

activity reduced the development of type 2 diabetes by 58% during a three-year period. The reduction was even greater, 71%, among adults aged 60 years and older. Interventions to prevent or delay type 2 diabetes in individuals with prediabetes can be feasible and cost-effective.

The evidence-based lifestyle change program, the National Diabetes Prevention Program (DPP), is a proven intervention for preventing diabetes in those at high risk for the disease. For more information, visit http://www.cdc.gov/diabetes/prevention/index.htm.

Attachment 5: Hospitalization Tables Including Race

Appendix Companion to Table 5A: Number and Percentage of Delivery and Non-delivery Maternal Hospital Stays and Type of Diabetes Diagnosis of Mother, Kentucky: 2015

Type of Maternal Stay	WHITE				BLACK				OTHER RACES			
	Pre-existing diabetes	Gestational Diabetes	No Diabetes Diagnosis	Total Maternal Stays	Pre-existing diabetes	Gestational Diabetes	No Diabetes Diagnosis	Total Maternal Stays	Pre-existing diabetes	Gestational Diabetes	No Diabetes Diagnosis	Total Maternal Stays
Total Maternal Stays	727	2,932	56,043	59,702	126	268	6,470	6,864	20	233	2,557	2,810
(% of all maternal stays by diabetes type)	1.22%	4.91%	93.87%	100.00%	1.84%	3.90%	94.26%	100.00%	0.71%	8.29%	91.00%	100.00%
Non-Delivery Stays	220	175	15,094	15,489	50	31	1,981	2,062	8	15	708	731
(% of total stays which are non-delivery)	30.26%	5.97%	26.93%	25.94%	39.68%	11.57%	30.62%	30.04%	40.00%	6.44%	27.69%	26.01%
Stays with Delivery	507	2,757	40,949	44,213	76	237	4,489	4,802	12	218	1,849	2,079
(% of total stays with delivery)	69.74%	94.03%	73.07%	74.06%	60.32%	88.43%	69.38%	69.96%	60.00%	93.56%	72.31%	73.99%

Source: 2015 Kentucky Hospital Discharge Data, based on all listed diagnoses

Appendix Companion to Table 5B: Number and Percentage of Vaginal and C-Section Deliveries by Type of Diabetes Diagnosis of Mother, Kentucky: 2015												
	WHITE				BLACK				OTHER RACES			
Type of Delivery	Pre-existing diabetes	Gestational Diabetes	No Diabetes Diagnosis	Total Delivery Stays	Pre-existing diabetes	Gestational Diabetes	No Diabetes Diagnosis	Total Delivery Stays	Pre-existing diabetes	Gestational Diabetes	No Diabetes Diagnosis	Total Delivery Stays
Number of Delivery Stays	507	2,757	40,949	44,213	76	237	4,489	4,802	12	218	1,849	2,079
(% of all delivery stays by diabetes type)	1.15%	6.24%	92.62%	100.00%	1.58%	4.94%	93.48%	100.00%	0.58%	10.49%	88.94%	100.00%
Vaginal	157	1,461	26,912	28,530	33	106	2,880	3,019	5	127	1,281	1,413
(% of deliveries by diabetes type)	30.97%	52.99%	65.72%	64.53%	43.42%	44.73%	64.16%	62.87%	41.67%	58.26%	69.28%	67.97%
C-Section	350	1,296	14,037	15,683	43	131	1,609	1,783	7	91	568	666
(% of deliveries by diabetes type)	69.03%	47.01%	34.28%	35.47%	56.58%	55.27%	35.84%	37.13%	58.33%	41.74%	30.72%	32.03%
Source: 2015 Kentucky Hospital Discharge Data, based on all listed diagnoses												

Appendix Companion to Table 12: Kentucky Inpatient Discharges for Diabetes Primary Diagnosis - Complications - Calendar year 2015												
Source: Kentucky Inpatient Hospital Discharge Claims 2015 Primary Diagnosis = Any 250-250.99(ICD9) or Any E10-E13.x (ICD10)												
	White				Black or African American				Other Race			
Complications by ICD9 Code*	Total Discharges	Percent of Discharges	ALOS	Avg. Charge	Total Discharges	Percent of Discharges	ALOS	Avg. Charge	Total Discharges	Percent of Discharges	ALOS	Avg. Charge
Without mention of complication	493	6.3%	3.11	$13,818	106	8.1%	2.75	$13,887	8	7.0%	3.00	$13,984
Ketoacidosis (DKA)	3,072	39.5%	3.04	$19,704	481	36.9%	3.51	$22,268	63	54.8%	3.27	$19,800
Hyperosmolarity	245	3.2%	3.52	$23,129	82	6.3%	3.48	$24,442	5	4.3%	2.80	$22,130
With Renal Manifestations	125	1.6%	6.53	$54,800	37	2.8%	5.97	$90,355	1	0.9%	4.00	$21,110
With Ophthalmic manifestations	3	0.0%	4.00	$19,878	0	0.0%	0	0	0	0.0%	0	0
With Neurological Manifestations	751	9.7%	5.12	$31,700	189	14.5%	4.79	$29,341	7	6.1%	7.29	$38,303
With Peripheral Circulatory Disorders	536	6.9%	8.99	$61,774	71	5.5%	8.92	$53,900	9	7.8%	13.78	$111,483
Other Specified Manifestations	2,495	32.1%	6.70	$36,138	329	25.3%	5.72	$32,535	22	19.1%	8.55	$47,704
Unspecified Complications	55	0.7%	3.13	$11,018	7	0.5%	4.14	$17,598	0	0.0%	0	0
Total	7,775	100.0%	4.90	$29,274	1,302	100.0%	4.56	$28,979	115	100.0%	5.31	$33,148
*** During calendar year 2015 medical coding shifted from ICD-9-CM codes to more detailed ICD-10-CM codes. ICD-10-CM Codes were cross-walked to match the ICD-9-CM Rubric**												

Appendix Companion to Table 16: Emergency Department Encounters with Diabetes coded as the Primary Reason for the Admission												
ADD of Patient Residence	White			Black			Other			Total		
	Cases	Average Charges	Total Charges	Cases	Average Charges	Total Charges	Cases	Average Charges	Total Charges	Cases	Average Charges	Total Charges
PURCHASE	422	$3,265	$1,377,857	90	$3,316	$298,455	7	$2,701	$18,909	519	$3,266	$1,695,221
PENNYRILE	601	$3,185	$1,914,088	148	$3,423	$506,632	5	$1,913	$9,566	754	$3,223	$2,430,286
GREEN RIVER	505	$3,806	$1,922,064	93	$4,343	$403,886	13	$3,338	$43,399	611	$3,878	$2,369,349
BARREN RIVER	669	$3,044	$2,036,326	92	$3,030	$278,791	5	$1,426	$7,130	766	$3,032	$2,322,248
LINCOLN TRAIL	620	$2,834	$1,757,267	85	$2,877	$244,587	9	$4,147	$37,320	714	$2,856	$2,039,174
KIPDA	1,379	$4,281	$5,904,122	868	$4,227	$3,668,839	59	$5,047	$297,798	2,306	$4,280	$9,870,758
NORTHERN KY	762	$2,451	$1,867,537	59	$2,070	$122,130	15	$1,545	$23,179	836	$2,408	$2,012,845
BUFFALO TRACE	105	$3,201	$336,108	7	$1,644	$11,508	Suppressed	Suppressed	Suppressed	116	$3,061	$355,124
GATEWAY	340	$2,957	$1,005,376	19	$3,457	$65,692	Suppressed	Suppressed	Suppressed	363	$2,966	$1,076,660
FIVCO	534	$3,183	$1,699,492	Suppressed	Suppressed	Suppressed	Suppressed	Suppressed	Suppressed	535	$3,179	$1,700,552
BIG SANDY	612	$5,523	$3,380,206	Suppressed	Suppressed	Suppressed	Suppressed	Suppressed	Suppressed	615	$5,540	$3,406,855
KY RIVER	537	$5,030	$2,700,894	14	$7,741	$108,378				551	$5,098	$2,809,272
CUMBERLAND VALLEY	978	$3,426	$3,350,415	16	$3,598	$57,574	5	$2,994	$14,971	999	$3,426	$3,422,960
LAKE CUMBERLAND	662	$3,378	$2,236,507	22	$3,559	$78,293	Suppressed	Suppressed	Suppressed	687	$3,380	$2,322,348
BLUEGRASS	1,779	$3,408	$6,063,229	421	$3,327	$1,400,860	28	$2,782	$77,907	2,228	$3,385	$7,541,995
Total	10,505	$3,575	$37,551,486	1,936	$3,745	$7,251,148	159	$3,604	$573,013	12,600	$3,601	$45,375,647
Note: Data in cells with fewer than 5 cells are suppressed due to the sample size being too small to ensure patient privacy.												

Glossary/Acronym List

ABCs - Acronym referring to key elements of care for diabetes, heart disease and stroke. The letter "A" may be used to stand for Aspirin and/or A1C, the letter "B" is for blood pressure, the letter "C" for cholesterol/lipid management, and the letter "s" for smoking/tobacco cessation.

A1C - Blood test that provides information about a person's average levels of blood glucose (sugar), over the past 3 months. The A1C test is sometimes called the hemoglobin A1C, HBA1c, or glycohemoglobin test.

Behavioral Risk Factor Surveillance System (BRFSS) - a cross-sectional telephone health survey jointly sponsored by the CDC and the Kentucky Department for Public Health (the University of Kentucky Survey Research Center conducts the survey). The survey is randomly administered to non-institutionalized civilian adults aged 18 or over. Participation in the survey is strictly voluntary and personal identifying information is not collected. This survey is a key source of chronic disease prevalence data which is used in health reports comparing state and county level data such as the County Health Rankings.

Chronic Disease - Diseases of long duration and generally slow progression. Chronic diseases, such as heart disease, stroke, cancer, chronic respiratory diseases and diabetes are leading causes of mortality worldwide.

Diabetes Prevention Program (DPP) - The CDC-led National Diabetes Prevention Program is an evidence-based lifestyle change program for preventing type 2 diabetes.

Electronic Health Record - a longitudinal electronic record of patient information generated by one or more encounters in any care delivery setting. Designed to share information with other health care providers so that data can be created, managed, and consulted by authorized clinicians and staff across more than one healthcare organization.

Health Information Technology - a global term (which encompasses electronic health records and personal health records) to indicate the use of computers, software programs, electronic devices and the internet to store, retrieve, update and transmit information about patients' health.

KEHP - Kentucky Employees' Health Plan is a non-profit, self-funded health plan that offers health insurance benefits and flexible spending accounts to nearly 300,000 members. This group is composed of eligible employees of state agencies, boards of education, health departments and quasi agencies. Also retirees of Kentucky Community Technical College System, retirees of the Kentucky Retirement Systems, Teachers' Retirement System, the Legislators' Retirement Plan and the Judicial Retirement Plan who are under age 65, and their eligible dependents.

Kentucky Health Information Exchange - a common, secure electronic health information infrastructure. The KHIE architecture meets national standards to ensure interoperability across various health systems and connectivity to the National Health Information Network. The system affords healthcare providers the functionality to support preventive health and disease management through alerts, messaging and other tools. KHIE provides a baseline set of functions available across the state to support the exchange of electronic health information.

Prediabetes - a condition in which individuals have blood glucose or A1C levels higher than normal but not high enough to be classified as diabetes. People with prediabetes have an increased risk of developing type 2 diabetes, heart disease and stroke.

Acronym List	
A1C	Hemoglobin A1C
ABCs	A1C, Blood Pressure, Cholesterol, and Smoking
ADA	American Diabetes Association
ADD	Area Development District
AHRQ	Agency for Healthcare Research and Quality
ALOS	Average Length of Stay
BMI	Body Mass Index
BRFSS	Behavioral Risk Factor Surveillance System
CDC	Centers for Disease Control and Prevention
CHW	Community Health Worker
COPD	Chronic Obstructive Pulmonary Disease
DKA	Diabetic Ketoacidosis
DM	Disease Management
DMS	Department for Medicaid Services
DPH	Department for Public Health
DPP	Diabetes Prevention Program
DSME	Diabetes Self-Management Education
ED	Emergency Department
EHR	Electronic Health Record

EMR	Electronic Medical Record
EQR	External Quality Review
FFS	Fee for Service
FFY	Federal Fiscal Year
FQHC	Federally Qualified Health Center
HCS	Humana CareSource
HEDIS	Healthcare Effectiveness Data and Information Set
HIT	Health Information Technology
KDPCP	Kentucky Diabetes Prevention and Control Program
KEHP	Kentucky Employees' Health Plan
KHA	Kentucky Hospital Association
KHIE	Kentucky Health Information Exchange
KYBRFSS	Kentucky Behavioral Risk Factor Surveillance Survey
LHD	Local Health Department
MCO	Managed Care Organization
NACDD	National Association of Chronic Disease Directors
OHE	Office of Health Equity
OHP	Office of Health Policy
PHP	Passport Health Plan
PQI	Prevention Quality Indicators
Rx	Prescription
SFY	State Fiscal Year
USPSTF	U.S. Preventive Services Task Force